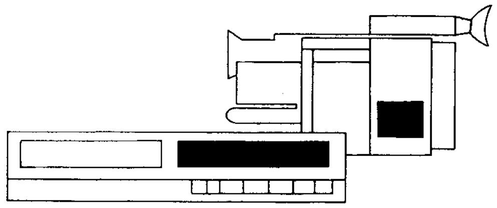
NOKIA
CONSUMER ELECTRONICS



VR

1990

NOKIA UNTERHALTUNGSELEKTRONIK GmbH
Service, Östliche 132, Postfach 1526
D-7530 Pforzheim

Service-Manual

ITT NOKIA

VR 3731
VR 3731 VPS

Luxor

VR 3731 LX

(D) Schaltbilder, Leiterplatten, Ersatzteile-Liste

Elektrischer Abgleich und Mechanik-Justagen, siehe Rückseite

⚠ **Sicherheitsbauteil!**
Dieses Symbol kennzeichnet in den Schaltbildern alle Bauteile, die nur durch Originalteile ersetzt werden dürfen.

Bei Reparaturen gültige Sicherheitsvorschriften beachten!

(GB) Circuit diagrams, P.C.B., spare parts list

Electrical alignment and mechanical adjustments, see rear page

⚠ **Safety Component!**
This symbol identifies in the circuit diagrams all safety critical parts. Replace only with specified part numbers.

Service and repair work to be performed only in accordance with existing safety regulations!

(F) Schémas, circuits imprimés, liste des pièces détachées

Alignement et mécanique ajustages, voir page précédante

⚠ **Composant de protection!**
Ce symbol indique tous les composants dans les schémas, qui doivent être remplacés uniquement par des pièces d'origines.

Pendant le dépannage respecter les régulations du sécurité!

Änderungen vorbehalten
Modifications reserved
Modifications réservées

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6611 77 09
(611) SA

Liste der Service-Manuale Liste of Service Manuals Liste des manuals		Schaltbilder, Leiterplatten, Ersatzteile-Liste Circ. diagr., P.C.B.,spare parts list Schémas circ. imprimés, liste des pièces détachées	Elektrischer Abgleich Electrical alignment Alignement	Mechanik-Justagen Mechanical adjustments Mécanique ajustages
	Modell Model Modèle	No.	No.	No.
ITT NOKIA	VR 3701 VPS	6611 77 04	6611 77 05	6611 77 06
LUXOR	VR 3701 LX			
ITT NOKIA	VR 3701			
ITT NOKIA	VR 3721 VPS			
LUXOR	VR 3721 LX			
ITT NOKIA	VR 3721			
ITT NOKIA	VR 3701 UK	6611 77 07		
ITT NOKIA	VR 3701 V			
ITT NOKIA	VR 3721 UK			
ITT NOKIA	VR 3701 H	6611 77 08		
ITT NOKIA	VR 3731 VPS	6611 77 09	6611 77 10	
ITT NOKIA	VR 3731			
LUXOR	VR 3731 LX			
ITT NOKIA	VR 3731 UK	6611 77 11		
ITT NOKIA	VR 3761 HIFI VPS	6611 77 12	6611 77 13	
ITT NOKIA	VR 3761 HIFI NICAM	6611 77 14		
LUXOR	VR 3761 HIFI NICAM LX			
ITT NOKIA	VR 3761 HIFI UK	6611 77 15		
ITT NOKIA	VR 3781 HIFI VPS	6611 77 16	6611 77 17	
ITT NOKIA	VR 3781 HIFI NICAM	6611 77 18		
LUXOR	VR 3781 HIFI NICAM LX			
OCEANIC	VR 3721 S	6611 77 19	6611 77 20	
OCEANIC	VR 3701 S			
OCEANIC	VR 3741 MS	6611 77 21		
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CIRCUIT DIAGRAM

NOTE: 1. Parts order must contain Model Number, Part Number and Description.
2. N.S.P. : Not avilable as service parts.

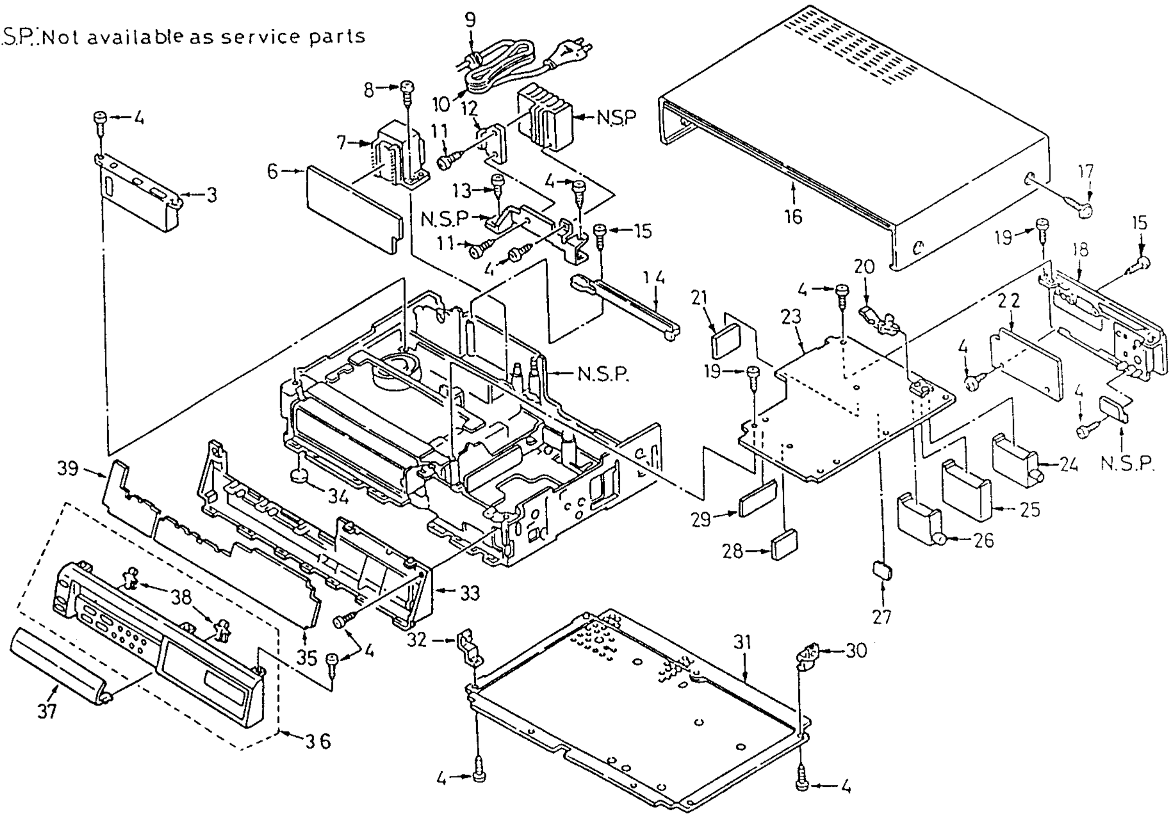
LOCATION	PARTS NO.	DESCRIPTION
ACCESSORIES		
	613 111 4180	REMOCON,RC231(VR 3731,VR 3731 VPS)
OR	613 111 4203	REMOCON,RC531(VR 3731 LX)
	613 111 3831	INSTRUCTION MANUAL(VR 3731 VPS)
OR	613 111 3893	INSTRUCTION MANUAL(VR 3731 LX)
OR	613 111 3862	INSTRUCTION MANUAL(VR 3731)
	613 077 4415	CABLE,ANT(VR 3731 VPS)
OR	613 096 6773	CABLE,ANT(VR 3731,VR 3731 LX)
OR	613 011 7359	CABLE,ANT(VR 3731,VR 3731 LX)

LOCATION	PARTS NO.	DESCRIPTION
PACKING MATERIALS		
	613 093 7735	CORR CASE,INNER
	613 077 4507	CUSHION INNER,FRONT
	613 077 4514	CUSHION INNER,BACK

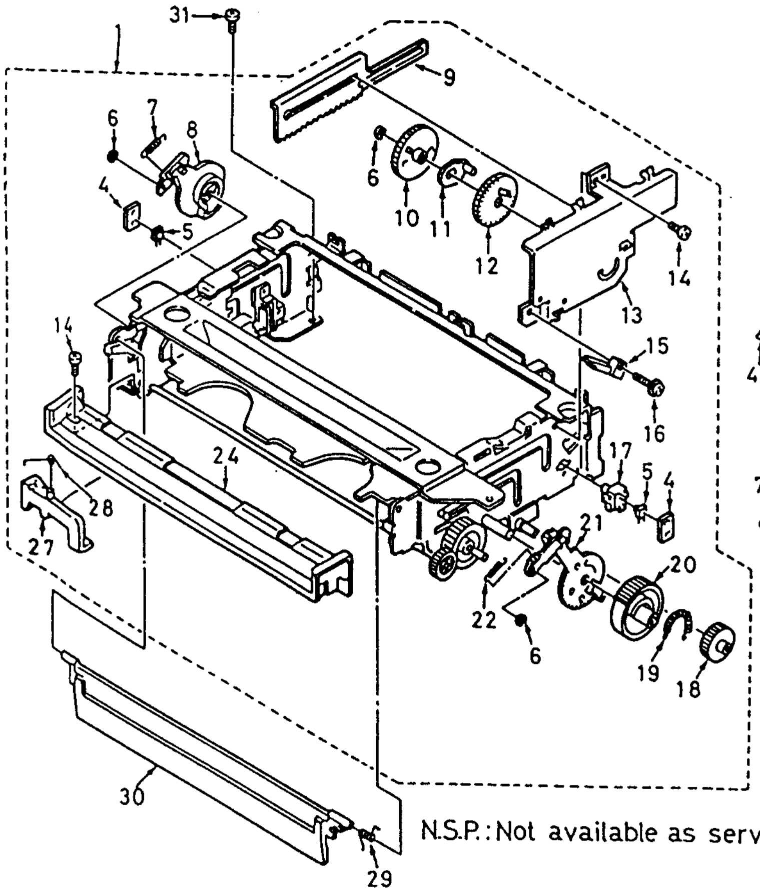
CABINET & CHASSIS PARTS

LOCATION		PARTS NO.	DESCRIPTION
3		613 114 8093	COMPL,VP-1
4		411 137 0007	SCR L-TPG BIN 3X10
6		613 109 4505	COMPL,PW-1(VR 3731 VPS)
OR		613 109 4512	COMPL,PW-1(VR 3731,VR 3731 LX)
7	⚠	613 110 4211	TRANS,POWER,T5001
8		411 021 9604	SCR S-TPG BIN 4X8
9	⚠	613 053 6686	FIXER
10		613 086 0507	CORD,POWER
OR		613 086 2150	CORD,POWER
11		411 021 4500	SCR S-TPG BIN 3X16
12		613 109 4529	COMPL,PW-2
13		411 021 5705	SCR S-TPG BIN 3X6
14		613 077 3487	BLIND
15		411 021 3701	SCR S-TPG BIN 3X10
16		613 112 2017	COVER,TOP
17		412 024 7604	SPECIAL SCREW
18		613 097 3351	TERMINAL
19		411 021 3800	SCR S-TPG BIN 3X10
20		613 059 4198	SPRING PLATE
21		613 108 4186	COMPL,VD-1
22		613 111 3145	COMPL,TB-1(VR 3731 VPS)
OR		613 109 4444	COMPL,TB-1(VR 3731,VR 3731 LX)
23		613 111 0113	COMPL,CP-A(VR 3731 VPS)
23		613 111 0137	COMPL,CP-A(VR 3131 LX)
OR		613 111 0120	COMPL,CP-A(VR 3731)
24		613 080 5836	MODULATOR,RF
OR		613 093 2990	MODULATOR,RF
25		613 108 3585	IF PACK
26		613 107 9410	TUNER PACK
27		613 109 4420	COMPL,TN-7
28		613 108 5534	COMPL,TM-8,VPS,P.C.B(VR 3731 VPS ONLY,VR 3731 OPTION)
29		613 109 4550	COMPL,SY-7
30		613 048 6912	BRACKET
31		613 022 0578	COVER,BOTTOM
32		613 022 0738	BRACKET,CABINET
33		613 077 2527	FRAME
34		613 047 1772	STAND
35		613 111 3190	COMPL,TM-1
36		613 111 5187	ASSY,CABINET,FRONT(VR 3731 VPS)
OR		613 111 5217	ASSY,CABINET,FRONT(VR 3731 LX)
OR		613 111 5194	ASSY,CABINET,FRONT(VR 3731)
37		613 111 3442	ASSY,DOOR
38		613 048 2884	LOCK
39		613 110 1814	COMPL,TM-2

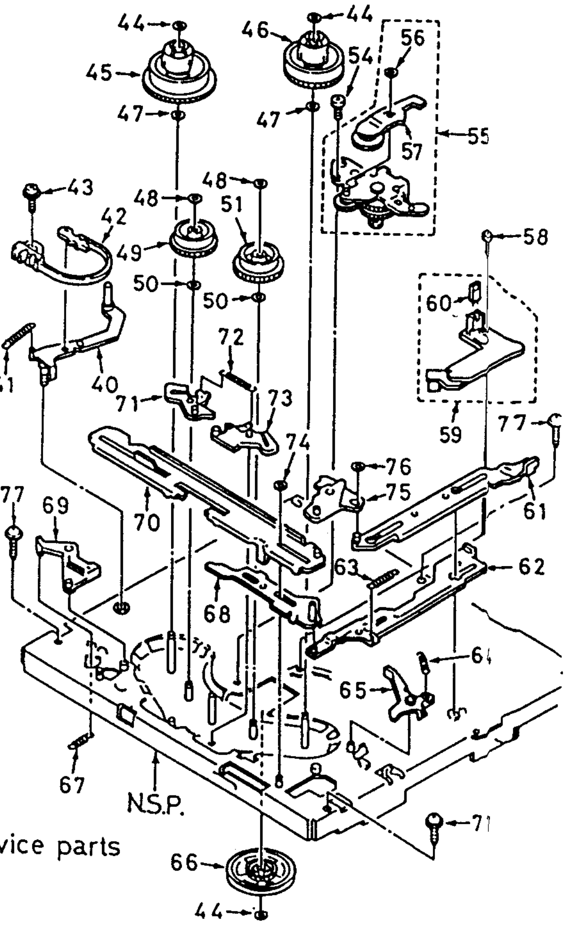
N.S.P.:Not available as service parts



LOCATION	PARTS NO.	DESCRIPTION
MECHANISM PARTS 1		
1	613 087 4412	COMPL,CASSETTE MECHA
4	613 022 0585	LID
5	407 098 3201	PHOTO COUPLE PN150SAN
6	411 015 9801	RING E 2.3
7	613 022 1643	SPRING,LINK L
8	613 022 0073	ASSY,GEAR,LEVER L
9	613 022 2695	RACK
10	613 022 2633	GEAR,LOCK
11	613 021 9916	ASSY,LEVER,PINION
12	613 022 2626	GEAR,PINION
13	613 021 9657	ASSY,BRACKET,GEAR
14	411 027 1305	SCR S-TPG BIN 2.6×4
15	613 006 4479	SPECIAL SWITCH
OR	613 095 0949	SPECIAL SWITCH
16	411 106 9208	SCR PAN+SW+W 2×9
17	613 022 0936	HOLDER,TRANSISTOR
18	613 022 2619	GEAR,IDLER
19	613 022 1667	SPRING,GEAR MAIN
20	613 022 2596	GEAR,MAIN
21	613 022 0097	ASSY,GEAR,LEVER R
22	613 022 1674	SPRING,LINK R
24	613 022 4064	BOARD,UNDER
27	613 022 2237	LEVER,SAFETY SWITCH
28	613 022 1827	SPRING,SAFETY SWITCH
29	613 022 1803	SPRING,DOOR
30	613 110 7458	CASSETTE DOOR
31	411 001 8702	SCR BIN 3×6
40	613 100 0391	ASSY,LEVER,TENSION
41	613 085 7996	SPRING,LEVER TENSION
42	613 021 9701	ASSY,HOLDER,BAND
43	411 036 2805	SCR PAN+SW+W 2.6×6
44	411 109 1605	WASHER Y 2.6×6×0.25
45	613 078 8375	ASSY,REEL,SUPPLY
46	613 022 0110	ASSY,REEL,TAKE UP
47	412 021 5306	SPECIAL WASHER 3.1×6×0.3
OR	412 015 8900	SPECIAL WASHER 3.1×6×0.4
OR	412 015 8504	SPECIAL WASHER 3.1×6×0.5
48	411 109 1506	WASHER Y 2.1×6×0.25
OR	411 109 1407	WASHER Y 2.1×5×0.25
49	613 098 7174	GEAR,REEL SUPPLY
50	412 026 7305	SPECIAL WASHER 2.6×6×0.25
51	613 098 7181	GEAR,REEL TAKE UP
54	411 031 0905	SCR BIN 2.6×4
55	613 085 7101	COMPL,IDLER,CLUTCH
56	411 120 1301	WASHER Y 2.1×4×0.25
57	613 022 0134	ASSY,IDLER
58	411 021 3107	SCR S-TPG BIN 2.6×8
59	613 078 6302	COMPL,MC-4
60	407 016 7205	LED LN59
61	613 021 9985	ASSY,SLIDE,ACT PLATE
62	613 112 8088	SLIDE,CONTROL BRAKE
OR	613 021 9992	ASSY,SLIDE,C BRAKE
63	613 022 1612	SPRING,RETURN SLIDE
64	613 022 1506	SPRING,SUB T
65	613 098 0106	ASSY,BRAKE,SUB T
66	613 077 3647	PULLEY,REEL
67	613 022 1490	SPRING,SUB SUPPLY
68	613 022 2374	SLIDE,ACT BRAKE
69	613 084 8871	BRAKE,SUB SUPPLY
70	613 022 0004	ASSY,SLIDE,M PLATE
71	613 080 9216	ASSY,BRAKE,SUPPLY
72	613 086 2914	SPRING,MAIN BRAKE
73	613 080 9209	ASSY,BRAKE,TAKE UP
74	411 109 3005	WASHER Y 2.6×5×0.5
75	613 022 2015	LEVER,CONT PLATE
76	412 015 9501	SPECIAL WASHER
77	411 021 7907	SCR S-TPG BIN 4×12



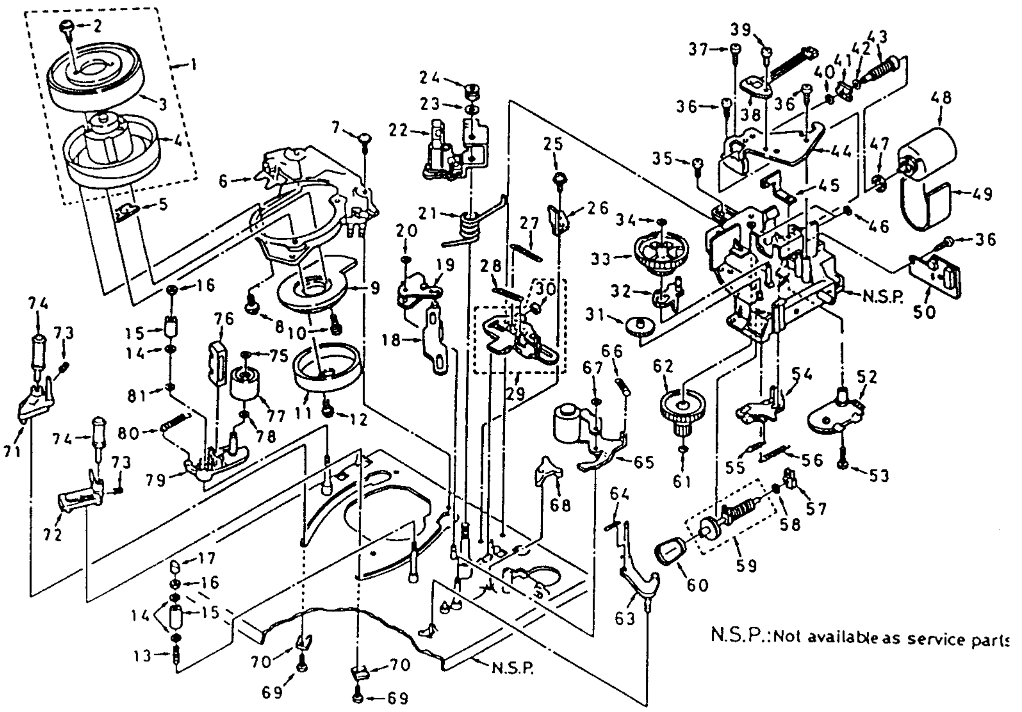
N.S.P.:Not available as service parts



MECHANISM PARTS 2

LOCATION	PARTS NO.	DESCRIPTION
1	613 079 8046	COMPL,CYLINDER,2N3P
OR	613 087 6935	COMPL,CYLINDER,2N3P
2	411 038 1608	SCR PAN+W 3×8
3	613 079 8039	ASSY,CYLINDER,UPR 2N3P
OR	613 087 6928	ASSY,CYLINDER,UPR 2N3P
4	613 089 7275	ASSY,CYLINDER,LWR 3P
OR	613 089 7282	ASSY,CYLINDER,LWR 3P
5	613 081 4036	SPACER,MOTOR
6	613 022 1001	BASE,CYLINDER
OR	613 088 9072	BASE,CYLINDER
7	411 047 7509	SCR PAN+FLG 3×6
8	411 047 5000	SCR PAN+FLG 2.6×8
OR	412 030 9708	SPECIAL SCREW 2.6×8
9	613 085 7279	STATOR,MOTOR CYLINDER
10	411 044 9209	SCR PAN+SW 2.3×8
OR	411 044 8301	SCR PAN+SW 2.3×10
11	613 022 4019	ROTOR,MOTOR CYLINDER
12	411 044 9001	SCR PAN+SW 2.3×6
13	613 022 1766	SPRING,ADJUST GUIDE
14	613 053 3227	SPECIAL WASHER
15	613 058 3307	TAPE GUIDE
16	412 026 2607	SPECIAL NUT (M3)
17	613 085 2434	CAP
18	613 021 9961	ASSY,SLIDE,ACT PINCH
19	613 021 9800	ASSY,LEVER,CAM PINCH
20	411 109 2008	WASHER Y 3.1×8×0.5
21	613 022 1797	SPRING,ACE HEAD
22	613 021 9640	COMPL,BRACKET,HEAD
23	613 051 4615	SPACER
OR	613 110 1692	SPACER
24	412 015 8207	SPECIAL NUT (M5)
25	411 120 0007	SCR PAN+SW+W 2.6×5
26	613 022 0752	BRACKET,STOPPER
27	613 022 1575	SPRING,LINK LOCK
28	613 022 1582	SPRING,SLIDE BRAKE
29	613 094 9233	ASSY,SLIDE,CAM
30	613 022 2725	DAMPER
31	613 022 2534	GEAR,FRONT LOAD
32	613 094 1206	ASSY,LEVER,FRONT
33	613 077 3586	GEAR,HELICAL FRONT
34	613 027 0504	WASHER 4.1×6.5×R5T
35	411 046 8002	SCR PAN+SW+W 2.6×6
36	411 023 2801	SCR S-TPG PAN 2.6×6

LOCATION	PARTS NO.	DESCRIPTION
37	411 021 3107	SCR S-TPG BIN 2.6×8
38	613 089 4328	ASSY,SENSOR,DEW
39	411 040 2303	SCR PAN 2.6×5
40	613 053 2381	SPECIAL WASHER
41	613 077 3227	HOLDER,WORM
42	613 027 0382	WASHER
43	613 078 8320	ASSY,WORM,FRONT
44	613 117 0599	BRACKET,HOLDER
OR	613 111 8522	BRACKET,HOLDER
OR	613 110 1203	BRACKET,HOLDER
OR	613 092 5862	BRACKET,HOLDER
45	613 093 9159	PLATE,NUT
46	613 093 8374	DAMPER,MOTOR
47	613 077 3616	DAMPER,WORM
48	613 021 9527	ASSY,LOADING MOTOR
49	613 092 9945	DAMPER,MOTOR
50	613 107 2732	COMPL,MC-3
52	613 110 0374	ROTARY SWITCH
53	411 126 5303	SCR PAN 2.6×13
54	613 092 9921	ASSY,SLIDE,FRONT
55	613 092 5985	SPRING,LEVER LOAD
56	613 092 5992	SPRING,LEVER ACT
57	613 092 5886	HOLDER,WORM
58	613 027 0627	WASHER 2.1×6×0.5
59	613 092 9938	ASSY,WORM,LOAD
60	613 022 2985	BELT,LOADING
61	412 033 4106	WASHER SLIT 2.6×5×0.5
62	613 077 3579	GEAR,HELICAL
63	613 102 9293	ASSY,LEVER,REV GUIDE
64	613 022 1568	SPRING,REVIEW LEVER
65	613 022 0158	COMPL,PINCH ROLLER
66	613 022 1483	SPRING,PINCH ROLLER
67	411 109 2107	WASHER Y 3.6×6×0.5
68	613 078 8160	COMPL,LEVER,ACT BRAKE
69	411 031 1209	SCR BIN 2.6×5
70	613 022 1919	PLATE,GUIDE
71	613 021 9725	ASSY,BASE,ROLLER S
72	613 021 9732	ASSY,BASE,ROLLER T
73	411 063 0904	SCR SET HEX-SCT 2×3
74	613 022 0233	ASSY,GUIDE,ROLLER
75	411 109 2602	WASHER Y 1.5×4×0.25
76	613 022 4224	HEAD,FULL ERASE
77	613 022 2817	IMPEDACE ROLLER
78	412 032 5807	SPECIAL WASHER 2.1×5×0.13
79	613 093 8305	ASSY,LEVER,FE HEAD
80	613 022 1698	SPRING,ERASE HEAD
81	411 109 1704	WASHER Y 6.4×10×0.25



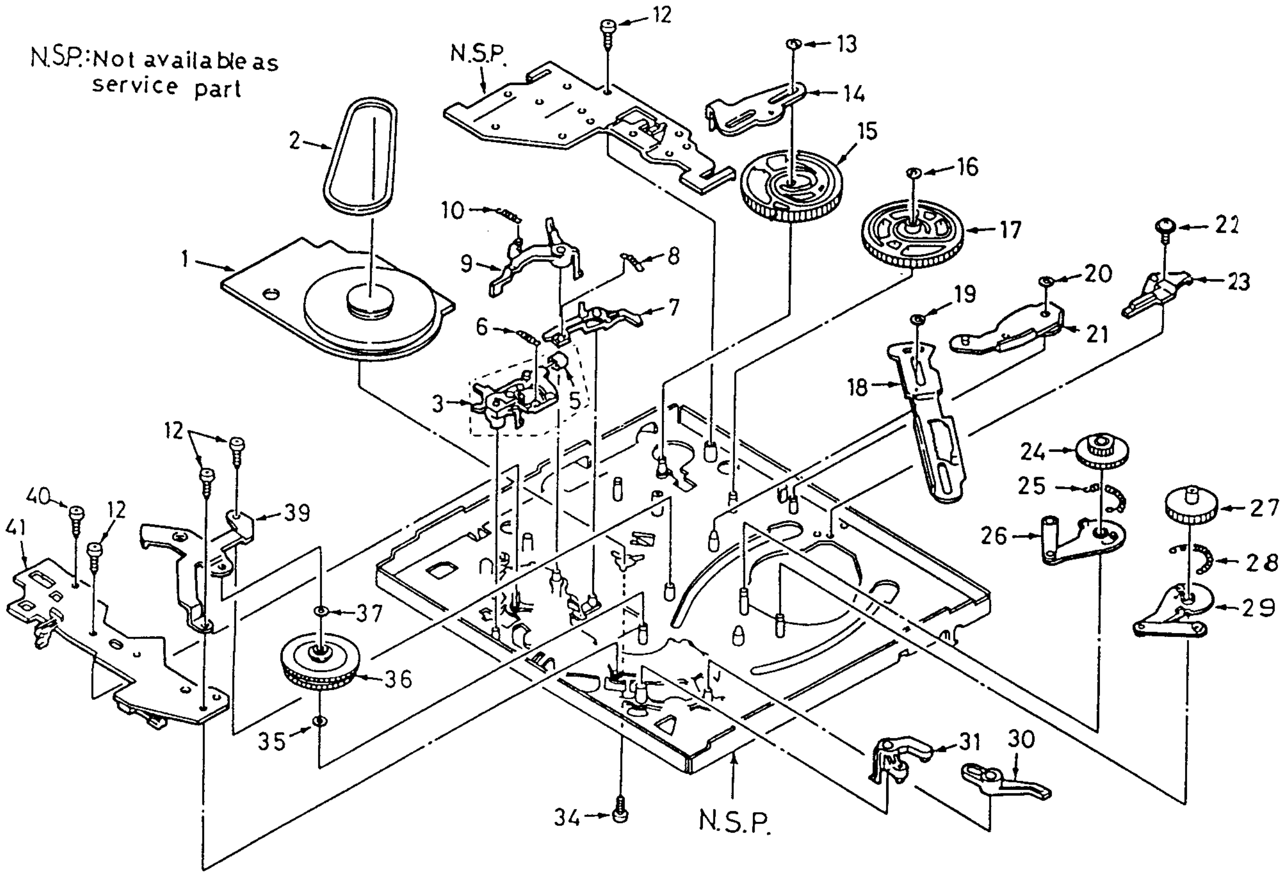
N.S.P.:Not available as service parts

MECHANISM PARTS 3

LOCATION	PARIS NO.	DESCRIPTION
1	613 022 4491	MOTOR,CAPSTAN
OR	613 080 8929	MOTOR,CAPSTAN
2	613 022 2978	BELT,REEL DRIVE
3	613 021 9848	ASSY,LEVER,CLUTCH
5	613 079 1023	DAMPER,LEVER CLUTCH
6	613 022 1520	SPRING,LEVER CLUTCH
7	613 082 3434	LEVER,CHANGE CLUTCH
8	613 022 1711	SPRING,CHANGE CLUTCH
9	613 081 7518	ASSY,BRAKE CAPSTAN
10	613 098 2285	SPRING,CAPSTAN
12	411 021 3107	SCR S-TPG BIN 2.6×8
13	411 109 2008	WASHER Y 3.1×8×0.5
14	613 021 9978	ASSY,SLIDE,CAM PLATE
15	613 022 2701	CAM,MODE
16	411 109 1902	WASHER Y 3.1×6×0.5
17	613 022 2718	CAM,MAIN
18	613 022 2664	RACK,LOAD
19	411 109 1803	WASHER Y 2.6×6×0.5
20	411 109 2107	WASHER Y 3.6×6×0.5
OR	411 109 2206	WASHER Y 3.6×8×0.5
21	613 021 9794	ASSY,LEVER,CAM LOAD
22	411 047 6809	SCR PAN+FLG 3×4
23	613 021 9763	ASSY,EARTH,CYLINDER
24	613 090 6380	GEAR,LOAD TAKE UP

LOCATION	PARIS NO.	DESCRIPTION
25	613 022 1551	SPRING,GEAR LOAD T
26	613 021 9879	ASSY,LEVER,LOAD T
27	613 090 6373	GEAR,LOAD SUPPLY
28	613 022 1704	SPRING,GEAR LOAD S
29	613 021 9862	ASSY,LEVER,LOAD S
30	613 022 2039	LEVER,RETURN TENSION
31	613 091 3104	ASSY,LEVER CONTROL
34	411 040 2303	SCR PAN 2.6×5
35	412 015 8603	SPECIAL WASHER 3.1×6×0.25
36	613 102 0900	ASSY,GEAR,FRICTION
37	411 109 1605	WASHER Y 2.6×6×0.25
39	613 079 8121	BRACKET,PULLEY
40	411 100 0300	SCR S-TPG BIN 2.6×5
41	613 110 1357	COMPL,MC-1
R1	401 026 0607	CARBON 270 JA 1/6W
OR	401 017 0708	CARBON 270 JA 1/4W
R2	401 024 6700	CARBON 100 JA 1/6W
OR	401 012 4404	CARBON 100 JA 1/4W
R3	401 026 0607	CARBON 270 JA 1/6W
OR	401 017 0708	CARBON 270 JA 1/4W
D1	407 094 1300	PHOTO COUPLE SPI-315-04-C
OR	407 043 0101	PHOTO DIODE ON2170-R
D2	407 094 1300	PHOTO COUPLE SPI-315-04-C
OR	407 043 0101	PHOTO DIODE ON2170-R
SW1	613 022 4545	SPECIAL SWITCH,EP

N.S.P:Not available as service part



ELECTRICAL PARTS

NOTE;

*Materials of Capacitors and Resistors are abbreviated as follows;

Resistors

MT-FILE	Metal Film Resistor
MT-GLAZE	Metal Glaze Resistor
OXIDE-MT	Oxide Metal Film Resistor

Capacitors

MT-POLYEST	Metallized Polyester Capacitor
MT-COMPO	Metallized Composite Capacitor
TA-SOLID	Tantalum Solid Capacitor
AL-SOLID	Aluminum Solid Capacitor
NP-ELECT	Non-Polarized Electrolytic Capacitor
OS-SOLID	Aluminum Solid Capacitors with Organic Semiconductive Electrolytic Capacitor
DL-ELECT	Double Layered Electrolytic Capacitor

*Tolerance of Capacitor(10pF over) and Resistor are noted with follow symboles.

F ············±1%　G ············±2%　J ············±5%　K ············±10%

M ············±20%　N ············±30%　Z ············+80% ~ −20%

*N.S.P. : Not available as service parts.

LOCATION	PARTS NO.	DESCRIPTION
COMPL,CP-A		
COMPL.NO.	613 111 0113	(VR 3731 VPS)
COMPL.NO.	613 111 0137	(VR 3731 LX)
COMPL.NO.	613 111 0120	(VR 3731)
VIDEO CIRCUIT(VD-A)		
B1001	405 000 6104	TR DTC144ES-DCTP
OR	405 018 2501	TR 2SC3399-AC
B1201	405 000 6104	TR DTC144ES-DCTP
OR	405 018 2501	TR 2SC3399-AC
C1001	403 025 7007	CERAMIC 4.7P D 50V
C1002	403 073 2702	CERAMIC 390P J 50V
C1003	403 026 2209	CERAMIC 47P J 50V
C1004	403 179 4501	NP-ELECT 0.47U M 50V
C1005	403 150 1703	CERAMIC 91P J 50V
C1006	403 071 1509	CERAMIC 180P J 50V
C1007	403 075 4001	CERAMIC 820P J 50V
C1008	403 134 4706	NP-ELECT 2.2U M 50V
C1009	403 001 1906	CERAMIC 0.01U M 16V
C1010	403 121 3408	ELECT 2.2U M 50V
C1011	403 130 2904	ELECT 0.47U M 50V
C1012	403 075 3103	CERAMIC 82P J 50V
C1013	403 068 8801	CERAMIC 100P J 50V
C1014	403 063 2200	POLYESTER 0.068U K 50V
C1015	403 001 1906	CERAMIC 0.01U M 16V
C1016	403 001 1906	CERAMIC 0.01U M 16V
C1017	403 001 1906	CERAMIC 0.01U M 16V
C1018	403 135 4002	ELECT 47U M 6.3V
C1019	403 121 3408	ELECT 2.2U M 50V
C1020	403 107 9905	ELECT 10U M 16V
C1021	403 121 3408	ELECT 2.2U M 50V
C1023	403 001 1906	CERAMIC 0.01U M 16V
C1024	403 121 2104	ELECT 22U M 10V
C1025	403 130 2904	ELECT 0.47U M 50V
C1031	403 001 1906	CERAMIC 0.01U M 16V
C1032	403 139 1403	ELECT 47U M 10V
C1033	403 139 2707	ELECT 1U M 50V
C1034	403 028 3402	CERAMIC 56P J 50V
C1035	403 025 7007	CERAMIC 4.7P D 50V
C1036	403 022 7703	CERAMIC 33P J 50V
C1037	403 139 2202	ELECT 4.7U M 25V
C1038	403 001 1906	CERAMIC 0.01U M 16V
C1039	403 001 1906	CERAMIC 0.01U M 16V
C1040	403 073 6205	CERAMIC 470P J 50V
C1051	403 071 1509	CERAMIC 180P J 50V
C1060	403 135 4002	ELECT 47U M 6.3V
C1061	403 001 1906	CERAMIC 0.01U M 16V
C1063	403 074 8703	CERAMIC 680P J 50V
C1065	403 017 9705	CERAMIC 22P J 50V
C1081	403 002 4203	CERAMIC 0.1U M 25V
C1101	403 003 2505	CERAMIC 0.022U J 25V
C1102	403 001 1906	CERAMIC 0.01U M 16V
C1103	403 109 6308	ELECT 1U M 50V
C1104	403 001 1906	CERAMIC 0.01U M 16V
C1105	403 109 6308	ELECT 1U M 50V
C1106	403 109 6308	ELECT 1U M 50V
C1107	403 003 2505	CERAMIC 0.022U J 25V
C1108	403 104 8505	CERAMIC 0.047U J 25V
C1109	403 001 1906	CERAMIC 0.01U M 16V
C1110	403 139 1809	ELECT 47U M 16V
C1111	403 001 1906	CERAMIC 0.01U M 16V
C1112	403 109 6308	ELECT 1U M 50V
C1113	403 104 8505	CERAMIC 0.047U J 25V
C1114	403 025 8608	CERAMIC 43P J 50V
C1115	403 150 1703	CERAMIC 91P J 50V
C1116	403 001 1906	CERAMIC 0.01U M 16V
C1117	403 135 4002	ELECT 47U M 6.3V
C1118	403 068 8801	CERAMIC 100P J 50V
C1119	403 001 1906	CERAMIC 0.01U M 16V
C1120	403 001 1906	CERAMIC 0.01U M 16V
C1121	403 001 1906	CERAMIC 0.01U M 16V
C1124	403 073 8407	CERAMIC 4700P K 50V
C1125	403 070 3702	CERAMIC 120P J 50V
C1126	403 001 1906	CERAMIC 0.01U M 16V
C1128	403 071 6207	CERAMIC 220P K 50V
C1201	403 073 6205	CERAMIC 470P J 50V
C1281	403 072 7500	CERAMIC 330P J 50V
C1401	403 139 2202	ELECT 4.7U M 25V
C1501	403 001 1906	CERAMIC 0.01U M 16V
C1502	403 001 1906	CERAMIC 0.01U M 16V
C1503	403 026 2209	CERAMIC 47P J 50V
C1504	403 068 8801	CERAMIC 100P J 50V
C1505	403 001 1906	CERAMIC 0.01U M 16V
C1506	403 028 3402	CERAMIC 56P J 50V
C1599	403 026 2209	CERAMIC 47P J 50V
C1605	403 135 4101	ELECT 470U M 6.3V
C1608	403 162 1807	ELECT 22U M 10V
C1609	403 094 2408	OS-SOLID 4.7U M 16V
C1631	403 022 7703	CERAMIC 33P J 50V
C1632	403 024 1501	CERAMIC 39P J 50V
C1682	403 012 6006	CERAMIC 15P J 50V
C1698	403 001 1906	CERAMIC 0.01U M 16V
C1699	403 001 1906	CERAMIC 0.01U M 16V
D1001	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D1002	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77

LOCATION	PARTS NO.	DESCRIPTION
D1031	407 070 8408	ZENER DIODE GZS9.1Y-TB
OR	407 053 8906	ZENER DIODE MTZ9.1C-T-77
D1501	407 077 3109	DIODE SB0015-03A-BT
D1502	407 077 3109	DIODE SB0015-03A-BT
D1604	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D1651	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
DL131	613 110 0367	DELAY,2H
OR	613 110 1708	DELAY,2H
IC101	409 178 3309	IC LA7340
IC102	409 171 9209	IC LC8992
IC111	409 208 7208	IC LA7332
L1001	613 014 0951	COIL,INDUCTOR 68UHK
L1031	613 014 0944	COIL,INDUCTOR 56UHK
L1032	613 014 0913	COIL,INDUCTOR 33UHK
L1033	613 014 0739	COIL,INDUCTOR 1.0UHM
L1057	613 014 0975	COIL,INDUCTOR 100UHK
L1058	613 014 0951	COIL,INDUCTOR 68UHK
L1101	613 014 0883	COIL,INDUCTOR 18UHK
L1102	613 014 0791	COIL,INDUCTOR 3.3UHK
L1103	613 014 0876	COIL,INDUCTOR 15UHK
L1104	613 015 6327	COIL,INDUCTOR 1MHJ
L1105	613 014 0920	COIL,INDUCTOR 39UHK
L1501	613 015 6174	COIL,INDUCTOR 56UHJ
L1502	613 015 6167	COIL,INDUCTOR 47UHJ
L1631	613 014 0975	COIL,INDUCTOR 100UHK
L1681	613 014 0777	COIL,INDUCTOR 2.2UHM
Q1001	405 093 0508	TR KSA1175-Y
OR	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1002	405 093 0607	TR KSC2785-Y
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1003	405 093 0607	TR KSC2785-Y
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1031	405 093 0508	TR KSA1175-Y
OR	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1032	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 093 0607	TR KSC2785-Y
Q1052	405 012 9506	TR 2SC2058S-DCTP-Q
OR	405 015 2504	TR 2SC2669-O-TPE4
OR	405 015 2603	TR 2SC2669-Y-TPE4
OR	405 016 0905	TR 2SC2839-E-SPA-AC
OR	405 016 1100	TR 2SC2839-F-SPA-AC
Q1054	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 093 0607	TR KSC2785-Y
Q1055	405 012 9506	TR 2SC2058S-DCTP-Q
OR	405 015 2504	TR 2SC2669-O-TPE4

LOCATION	PARTS NO.	DESCRIPTION
Q1055	405 015 2603	TR 2SC2669-Y-TPE4
OR	405 016 0905	TR 2SC2839-E-SPA-AC
OR	405 016 1100	TR 2SC2839-F-SPA-AC
Q1101	405 093 0508	TR KSA1175-Y
OR	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1102	405 093 0607	TR KSC2785-Y
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1103	405 093 0607	TR KSC2785-Y
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1104	405 093 0607	TR KSC2785-Y
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1105	405 093 0607	TR KSC2785-Y
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1106	405 093 0607	TR KSC2785-Y
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1151	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
OR	405 093 0508	TR KSA1175-Y
Q1401	405 093 0607	TR KSC2785-Y
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1402	405 006 6504	TR 2SA984-E-AA
OR	405 006 6702	TR 2SA984-F-AA
Q1403	405 093 0607	TR KSC2785-Y
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1404	405 089 0109	TR 2SA1707-T-AN
OR	405 084 7905	TR 2SB1240-TV2-R
Q1501	405 016 0905	TR 2SC2839-E-SPA-AC
OR	405 016 1100	TR 2SC2839-F-SPA-AC
OR	405 015 2603	TR 2SC2669-Y-TPE4
OR	405 015 2504	TR 2SC2669-O-TPE4
OR	405 012 9506	TR 2SC2058S-DCTP-Q
Q1502	405 016 0905	TR 2SC2839-E-SPA-AC
OR	405 016 1100	TR 2SC2839-F-SPA-AC
OR	405 015 2603	TR 2SC2669-Y-TPE4
OR	405 015 2504	TR 2SC2669-O-TPE4
OR	405 012 9506	TR 2SC2058S-DCTP-Q
Q1601	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1806	TR 2SA933S-T93-R
Q1602	405 093 0508	TR KSA1175-Y
OR	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R

LOCATION	PARTS NO.	DESCRIPTION
Q1631	405 093 0607	TR KSC2785-Y
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
R1001	401 012 5609	CARBON 1K JA 1/4W
R1002	401 017 1705	CARBON 2.7K JA 1/4W
R1003	401 022 1806	CARBON 680 JA 1/4W
R1004	401 012 9201	CARBON 1M JA 1/4W
R1005	401 012 5609	CARBON 1K JA 1/4W
R1006	401 017 1705	CARBON 2.7K JA 1/4W
R1007	401 012 5609	CARBON 1K JA 1/4W
R1008	401 014 4006	CARBON 1.5K JA 1/4W
R1009	401 012 5609	CARBON 1K JA 1/4W
R1010	401 017 8506	CARBON 300 JA 1/4W
R1011	401 015 2605	CARBON 1.8K JA 1/4W
R1012	401 015 4609	CARBON 180K JA 1/4W
R1013	401 012 9201	CARBON 1M JA 1/4W
R1014	401 016 3700	CARBON 2.2K JA 1/4W
R1015	401 023 2703	CARBON 8.2K JA 1/4W
R1016	401 013 5202	CARBON 1.2K JA 1/4W
R1018	401 012 5609	CARBON 1K JA 1/4W
R1019	401 016 2505	CARBON 220 JA 1/4W
R1020	401 020 3802	CARBON 470K JA 1/4W
R1021	401 014 6000	CARBON 150K JA 1/4W
R1022	401 022 1806	CARBON 680 JA 1/4W
R1023	401 016 4707	CARBON 22K JA 1/4W
R1024	401 018 4804	CARBON 33K JA 1/4W
R1025	401 016 3700	CARBON 2.2K JA 1/4W
R1031	401 012 5609	CARBON 1K JA 1/4W
R1032	401 012 5609	CARBON 1K JA 1/4W
R1033	401 019 9501	CARBON 47 JA 1/4W
R1034	401 020 7404	CARBON 51 JA 1/4W
R1051	401 016 4707	CARBON 22K JA 1/4W
R1052	401 016 4707	CARBON 22K JA 1/4W
R1056	401 019 0904	CARBON 390 JA 1/4W
R1057	401 015 2605	CARBON 1.8K JA 1/4W
R1068	401 021 1807	CARBON 560 JA 1/4W
R1070	401 012 5609	CARBON 1K JA 1/4W
R1071	401 021 1807	CARBON 560 JA 1/4W
R1072	401 019 0904	CARBON 390 JA 1/4W
R1101	401 020 2805	CARBON 47K JA 1/4W
R1102	401 016 4707	CARBON 22K JA 1/4W
R1103	401 012 5609	CARBON 1K JA 1/4W
R1104	401 013 5202	CARBON 1.2K JA 1/4W
R1105	401 018 2701	CARBON 330 JA 1/4W
R1106	401 021 1807	CARBON 560 JA 1/4W
R1107	401 012 5609	CARBON 1K JA 1/4W
R1108	401 012 5609	CARBON 1K JA 1/4W
R1109	401 012 6903	CARBON 10K JA 1/4W
R1110	401 023 2703	CARBON 8.2K JA 1/4W
R1111	401 012 5609	CARBON 1K JA 1/4W
R1112	401 015 2605	CARBON 1.8K JA 1/4W
R1113	401 012 8006	CARBON 100K JA 1/4W
R1114	401 019 0904	CARBON 390 JA 1/4W
R1115	401 012 5609	CARBON 1K JA 1/4W
R1116	401 012 5609	CARBON 1K JA 1/4W
R1117	401 014 4006	CARBON 1.5K JA 1/4W
R1118	401 022 7105	CARBON 750 JA 1/4W
R1119	401 012 5609	CARBON 1K JA 1/4W
R1120	401 012 4404	CARBON 100 JA 1/4W
R1121	401 012 5609	CARBON 1K JA 1/4W
R1122	401 020 0702	CARBON 470 JA 1/4W
R1123	401 014 4006	CARBON 1.5K JA 1/4W
R1124	401 021 0602	CARBON 56 JA 1/4W
R1125	401 023 1607	CARBON 820 JA 1/4W
R1126	401 012 5609	CARBON 1K JA 1/4W
R1127	401 012 4404	CARBON 100 JA 1/4W
R1128	401 012 5609	CARBON 1K JA 1/4W
R1152	401 019 1802	CARBON 3.9K JA 1/4W
R1401	401 016 4707	CARBON 22K JA 1/4W
R1402	401 016 4707	CARBON 22K JA 1/4W
R1403	401 023 2703	CARBON 8.2K JA 1/4W
R1404	401 020 1907	CARBON 4.7K JA 1/4W
R1405	401 020 2805	CARBON 47K JA 1/4W
R1406	401 020 2805	CARBON 47K JA 1/4W
R1407	401 015 2605	CARBON 1.8K JA 1/4W
R1408	401 016 2505	CARBON 220 JA 1/4W
R1501	401 018 3708	CARBON 3.3K JA 1/4W
R1502	401 017 2702	CARBON 27K JA 1/4W
R1503	401 020 0702	CARBON 470 JA 1/4W
R1504	401 019 0904	CARBON 390 JA 1/4W
R1505	401 015 9406	CARBON 2K JA 1/4W
R1506	401 017 2702	CARBON 27K JA 1/4W
R1507	401 020 0702	CARBON 470 JA 1/4W
R1508	401 012 4404	CARBON 100 JA 1/4W
R1603	401 012 6903	CARBON 10K JA 1/4W
R1607	401 021 1807	CARBON 560 JA 1/4W
R1608	401 022 6702	CARBON 75 JA 1/4W
R1609	401 013 9408	CARBON 1.3K JA 1/4W
R1610	401 021 1807	CARBON 560 JA 1/4W
R1631	401 021 2903	CARBON 5.6K JA 1/4W
R1632	401 012 5609	CARBON 1K JA 1/4W
R1633	401 023 1607	CARBON 820 JA 1/4W
R1634	401 015 2605	CARBON 1.8K JA 1/4W
R1641	401 015 2605	CARBON 1.8K JA 1/4W
VR101	613 001 9370	SEMI VR 1KB
OR	613 001 8977	SEMI VR 1KB
VR102	613 001 9035	SEMI VR 10KB
OR	613 001 9417	SEMI VR 10KB
VR103	613 001 9424	SEMI VR 20KB
OR	613 001 9059	SEMI VR 22KB
VR104	613 001 9035	SEMI VR 10KB
OR	613 001 9417	SEMI VR 10KB
VR105	613 001 8977	SEMI VR 1KB
OR	613 001 9370	SEMI VR 1KB
X1101	613 080 9407	OSC.CRYSTAL 4.43MHZ
OR	613 093 8008	OSC.CRYSTAL 4.433619MHZ
XF101	613 004 5539	LC PACK 4MHZ LPF
XF111	613 111 3800	FILTER.5.06 4.43M B.1M L

AUDIO CIRCUIT(AD-A)

LOCATION	PARTS NO.	DESCRIPTION
B2101	405 018 2501	TR 2SC3399-AC
OR	405 000 6104	TR DTC144ES-DCTP
C2001	403 049 1401	ELECT 1U M 50V
C2002	403 075 4506	CERAMIC 820P K 50V
C2004	403 135 3708	ELECT 33U M 6.3V
C2005	403 003 0600	CERAMIC 0.018U K 25V
C2006	403 130 2904	ELECT 0.47U M 50V
C2008	403 001 6505	CERAMIC 3300P K 16V
C2009	403 135 4002	ELECT 47U M 6.3V
C2010	403 107 9905	ELECT 10U M 16V
C2013	403 003 2406	CERAMIC 0.022U J 25V
C2016	403 109 6308	ELECT 1U M 50V
C2017	403 134 5901	ELECT 33U M 16V
C2018	403 121 3002	ELECT 4.7U M 25V
C2019	403 134 9602	ELECT 47U M 16V
C2020	403 071 6207	CERAMIC 220P K 50V
C2021	403 081 7409	POLYPRO 0.033U J 100V
C2022	403 002 1905	CERAMIC 0.01U K 25V
C2024	403 002 1905	CERAMIC 0.01U K 25V
C2025	403 003 3700	CERAMIC 0.022U Z 25V

LOCATION	PARTS NO.	DESCRIPTION
C2051	403 069 1207	CERAMIC 1000P K 50V
D2101	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D2102	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
IC201	409 133 1401	IC LA7294
L2002	613 014 3037	COIL,INDUCTOR 10MHJ
L2003	613 014 2870	COIL,INDUCTOR 560UHK
Q2001	405 024 9709	TR 2SD734-E-AA
OR	405 024 9907	TR 2SD734-F-AA
Q2101	405 033 6706	TR 2SD1468S-DCTP-R
OR	405 033 6805	TR 2SD1468S-DCTP-S
Q2102	405 033 6706	TR 2SD1468S-DCTP-R
OR	405 033 6805	TR 2SD1468S-DCTP-S
R2001	401 012 4404	CARBON 100 JA 1/4W
R2002	401 022 3008	CARBON 6.8K JA 1/4W
R2003	401 023 0600	CARBON 82 JA 1/4W
R2004	401 019 3905	CARBON 390K JA 1/4W
R2005	401 021 8905	CARBON 6.2K JA 1/4W
R2006	401 017 1705	CARBON 2.7K JA 1/4W
R2009	401 018 6501	CARBON 3.3M JA 1/4W
R2010	401 012 6903	CARBON 10K JA 1/4W
R2011	401 016 0006	CARBON 20K JA 1/4W
R2012	401 022 7600	CARBON 7.5K JA 1/4W
R2013	401 012 5609	CARBON 1K JA 1/4W
R2014	401 015 2605	CARBON 1.8K JA 1/4W
R2016	401 012 6903	CARBON 10K JA 1/4W
R2017	401 012 6903	CARBON 10K JA 1/4W
R2018	401 015 3701	CARBON 18K JA 1/4W
R2019	401 015 3701	CARBON 18K JA 1/4W
R2021	401 012 3308	CARBON 10 JA 1/4W
R2022	401 019 9501	CARBON 47 JA 1/4W
R2023	401 014 5102	CARBON 15K JA 1/4W
R2024	401 019 6104	CARBON 4.7 JA 1/4W
R2051	401 012 5609	CARBON 1K JA 1/4W
R2101	401 020 2805	CARBON 47K JA 1/4W
R2102	401 019 2908	CARBON 39K JA 1/4W
R2103	401 020 2805	CARBON 47K JA 1/4W
R2104	401 019 8207	CARBON 43K JA 1/4W (VR 3731,VR 3731 VPS)
OR	401 019 8207	CARBON 43K JA 1/4W (VR 3731 LX)
R2109	401 012 5609	CARBON 1K JA 1/4W
R2110	401 023 1607	CARBON 820 JA 1/4W
R2111	401 012 6903	CARBON 10K JA 1/4W
R2112	401 012 6903	CARBON 10K JA 1/4W
R2113	401 012 6903	CARBON 10K JA 1/4W
R2114	401 016 3700	CARBON 2.2K JA 1/4W
R2115	401 016 3700	CARBON 2.2K JA 1/4W
T2001	613 016 2205	OSC COIL 70KHZ
OR	613 094 3378	TRANS,OSC 70KHZ
VR201	613 001 9097	SEMI VR
VR202	613 001 9035	SEMI VR 10KB

SYSTEM CONTROL CIRCUIT(SY-A)

B3001	405 018 2808	TR 2SC3402-AC
C3001	403 155 2804	DL-ELECT 0.047F Z 5.5V
C3002	403 135 3500	ELECT 220U M 6.3V
C3003	403 121 9509	CERAMIC 0.1U Z 50V

LOCATION	PARTS NO.	DESCRIPTION
D3002	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3003	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3006	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
IC301	410 095 5703	IC UPD75516GF-117-3B9
R3001	402 036 4401	FUSIBLE RES 3.3 JA 1/2W
OR	402 036 3701	FUSIBLE RES 3.3 JA 1/2W
R3002	401 020 1907	CARBON 4.7K JA 1/4W
R3003	401 020 1907	CARBON 4.7K JA 1/4W
R3004	401 012 6903	CARBON 10K JA 1/4W
R3005	401 014 4006	CARBON 1.5K JA 1/4W
R3006	401 014 4006	CARBON 1.5K JA 1/4W
R3007	401 019 1802	CARBON 3.9K JA 1/4W
R3008	401 020 1907	CARBON 4.7K JA 1/4W
R3009	401 016 5704	CARBON 220K JA 1/4W
R3010	401 016 5704	CARBON 220K JA 1/4W
R3011	401 012 5609	CARBON 1K JA 1/4W
R3012	401 012 5609	CARBON 1K JA 1/4W
R3013	401 016 5704	CARBON 220K JA 1/4W
R3014	401 012 5609	CARBON 1K JA 1/4W
R3015	401 016 5704	CARBON 220K JA 1/4W
R3016	401 012 6903	CARBON 10K JA 1/4W
R3017	401 020 1907	CARBON 4.7K JA 1/4W
R3018	401 016 5704	CARBON 220K JA 1/4W
R3019	401 012 6903	CARBON 10K JA 1/4W
R3020	401 020 1907	CARBON 4.7K JA 1/4W
R3022	401 016 5704	CARBON 220K JA 1/4W
R3024	401 023 4509	CARBON 820K JA 1/4W
R3202	401 020 1907	CARBON 4.7K JA 1/4W
R3203	401 020 1907	CARBON 4.7K JA 1/4W
R3207	401 020 1907	CARBON 4.7K JA 1/4W
R3209	401 020 1907	CARBON 4.7K JA 1/4W
XF301	613 097 9698	RESONATOR,CERAMIC 4.0MHZ
OR	613 108 2496	RESONATOR,CERAMIC 4.0MHZ

SERVO CIRCUIT(SV-A)

B3503	405 018 2501	TR 2SC3399-AC
OR	405 000 6104	TR DTC144ES-DCTP
B3506	405 018 2501	TR 2SC3399-AC
OR	405 000 6104	TR DTC144ES-DCTP
B3507	405 018 2501	TR 2SC3399-AC
OR	405 000 6104	TR DTC144ES-DCTP
B3512	405 018 2501	TR 2SC3399-AC
OR	405 000 6104	TR DTC144ES-DCTP
C3501	403 057 6801	POLYESTER 0.012U J 50V
C3502	403 135 4002	ELECT 47U M 6.3V
C3503	403 121 9509	CERAMIC 0.1U Z 50V
C3504	403 071 6207	CERAMIC 220P K 50V
C3505	403 062 9101	POLYESTER 6800P J 50V
C3506	403 059 6502	POLYESTER 0.022U K 50V
C3507	403 002 8508	CERAMIC 0.015U K 25V
C3508	403 001 8806	CERAMIC 6800P K 16V
C3509	403 002 8508	CERAMIC 0.015U K 25V
C3510	403 145 8601	ELECT 22U M 16V
OR	403 042 8803	ELECT 22U M 16V
C3511	403 145 8601	ELECT 22U M 16V
OR	403 042 8803	ELECT 22U M 16V
C3512	403 063 0008	POLYESTER 6800P K 50V
C3513	403 168 6103	MT-POLYEST 0.1U J 50V
C3514	403 001 5003	CERAMIC 2200P K 16V
C3515	403 001 3801	CERAMIC 1500P K 16V
C3516	403 001 8806	CERAMIC 6800P K 16V

LOCATION	PARTS NO.	DESCRIPTION
C3517	403 145 8601	ELECT 22U M 16V
OR	403 042 8803	ELECT 22U M 16V
C3518	403 145 8601	ELECT 22U M 16V
OR	403 042 8803	ELECT 22U M 16V
C3519	403 175 0903	MT-POLYEST 0.12U J 50V
C3520	403 135 4002	ELECT 47U M 6.3V
C3525	403 069 1207	CERAMIC 1000P K 50V
C3526	403 108 0000	ELECT 0.22U M 50V
C3527	403 001 1609	CERAMIC 0.01U K 16V
C3528	403 109 6308	ELECT 1U M 50V
C3529	403 004 4607	CERAMIC 0.068U K 25V
C3530	403 107 9905	ELECT 10U M 16V
C3531	403 135 7805	ELECT 3.3U M 50V
C3532	403 074 9205	CERAMIC 680P K 50V
C3533	403 069 1207	CERAMIC 1000P K 50V
C3534	403 159 0806	NP-ELECT 33U M 6.3V
C3535	403 069 1207	CERAMIC 1000P K 50V
C3536	403 060 7505	POLYESTER 0.033U J 50V
C3537	403 135 4002	ELECT 47U M 6.3V
C3540	403 063 7700	POLYESTER 0.082U K 50V
C3541	403 070 4105	CERAMIC 120P K 50V
C3550	403 121 9509	CERAMIC 0.1U Z 50V
C3551	403 168 6103	MT-POLYEST 0.1U J 50V
C3552	403 168 6103	MT-POLYEST 0.1U J 50V
C3553	403 168 6103	MT-POLYEST 0.1U J 50V
C3554	403 168 6103	MT-POLYEST 0.1U J 50V
C3555	403 001 1609	CERAMIC 0.01U K 16V
C3556	403 086 2607	NP-ELECT 1U M 50V
C3557	403 001 1609	CERAMIC 0.01U K 16V
C3558	403 086 2607	NP-ELECT 1U M 50V
D3501	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D3502	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D3503	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D3504	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D3506	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3509	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3512	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3513	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3517	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3534	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3535	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3536	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3539	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3540	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3541	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
IC351	409 180 3403	IC LC7418-8084
IC352	409 159 8606	IC LA7122S
OR	409 178 3200	IC LA7124
Q3501	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 093 0607	TR KSC2785-Y

LOCATION	PARTS NO.	DESCRIPTION
Q3503	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 093 0607	TR KSC2785-Y
Q3505	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 093 0607	TR KSC2785-Y
R3503	401 016 4707	CARBON 22K JA 1/4W
R3504	401 016 4707	CARBON 22K JA 1/4W
R3505	401 017 3709	CARBON 270K JA 1/4W
R3509	401 015 3701	CARBON 18K JA 1/4W
R3510	401 018 4804	CARBON 33K JA 1/4W
R3511	401 012 6903	CARBON 10K JA 1/4W
R3512	401 012 8006	CARBON 100K JA 1/4W
R3513	401 012 8006	CARBON 100K JA 1/4W
R3514	401 018 5702	CARBON 330K JA 1/4W
R3515	401 014 5102	CARBON 15K JA 1/4W
R3516	401 014 6000	CARBON 150K JA 1/4W
R3517	401 014 6000	CARBON 150K JA 1/4W
R3518	401 012 6903	CARBON 10K JA 1/4W
R3519	401 020 2805	CARBON 47K JA 1/4W
R3520	401 020 2805	CARBON 47K JA 1/4W
R3521	401 018 5702	CARBON 330K JA 1/4W
R3522	401 014 6000	CARBON 150K JA 1/4W
R3523	401 017 2702	CARBON 27K JA 1/4W
R3527	401 014 6000	CARBON 150K JA 1/4W
R3528	401 012 8006	CARBON 100K JA 1/4W
R3529	401 012 6903	CARBON 10K JA 1/4W
R3534	401 016 3700	CARBON 2.2K JA 1/4W
R3535	401 016 3700	CARBON 2.2K JA 1/4W
R3538	401 012 5609	CARBON 1K JA 1/4W
R3539	401 021 9902	CARBON 620K JA 1/4W
R3540	401 014 6000	CARBON 150K JA 1/4W
R3541	401 018 7508	CARBON 360 JA 1/4W
R3542	401 020 7800	CARBON 510 JA 1/4W
R3543	401 020 7800	CARBON 510 JA 1/4W
R3548	401 012 6903	CARBON 10K JA 1/4W
R3549	401 012 8006	CARBON 100K JA 1/4W
R3550	401 012 6903	CARBON 10K JA 1/4W
R3551	401 014 6000	CARBON 150K JA 1/4W
R3552	401 018 5702	CARBON 330K JA 1/4W
R3553	401 014 0206	CARBON 130K JA 1/4W
R3554	401 012 6903	CARBON 10K JA 1/4W
R3555	401 018 5702	CARBON 330K JA 1/4W
R3560	401 012 5609	CARBON 1K JA 1/4W
R3561	401 015 2605	CARBON 1.8K JA 1/4W
R3563	401 012 5609	CARBON 1K JA 1/4W
R3564	401 012 5609	CARBON 1K JA 1/4W
R3565	401 022 8508	CARBON 750K JA 1/4W
R3566	401 012 8006	CARBON 100K JA 1/4W
R3571	401 012 8006	CARBON 100K JA 1/4W
R3572	401 020 2805	CARBON 47K JA 1/4W
R3584	401 023 7401	CARBON 9.1K JA 1/4W
R3585	401 017 3709	CARBON 270K JA 1/4W
R3590	401 013 6308	CARBON 12K JA 1/4W
R3593	401 018 5702	CARBON 330K JA 1/4W
R3594	401 012 5609	CARBON 1K JA 1/4W
VR351	613 001 9110	SEMI VR 220KB
OR	613 097 7953	VR,SEMI 220KB
VR353	613 001 9486	SEMI VR
OR	613 112 4936	VR,SEMI 500KB

POWER SUPPLY CIRCUIT(PW-A)

C5402	403 135 4002	ELECT 47U M 6.3V
D5403	407 053 3109	ZENER DIODE MTZ12A-T-77
D5404	407 078 2705	DIODE 1SS244-T-77

LOCATION	PARTS NO.	DESCRIPTION
D5405	407 078 1104	ZENER DIODE MTZ33A-T-77
D5406	407 053 2706	ZENER DIODE MTZ10C-T-77
Q5401	405 088 9103	TR 2SA1703-S-AN
Q5402	405 089 2103	TR 2SC4483-S-AN
Q5403	405 006 7006	TR 2SA984K-E-AA
OR	405 006 7204	TR 2SA984K-F-AA
Q5404	405 006 7006	TR 2SA984K-E-AA
OR	405 006 7204	TR 2SA984K-F-AA
R5401	401 021 8905	CARBON 6.2K JA 1/4W
R5402	401 016 3700	CARBON 2.2K JA 1/4W
R5403	401 012 5609	CARBON 1K JA 1/4W
R5404	402 042 1807	FUSIBLE RES 1.5K JA 1/4W
R5405	401 021 2903	CARBON 5.6K JA 1/4W
R5406	401 014 5102	CARBON 15K JA 1/4W
R5407	401 019 7705	CARBON 4.3K JA 1/4W
R5408	402 004 1906	FUSIBLE RES 47 JA 1/4W
R5409	401 013 6308	CARBON 12K JA 1/4W
R5410	401 014 2804	CARBON 150 JA 1/4W
R5411	401 014 2804	CARBON 150 JA 1/4W

TUNER CIRCUIT(TN-A)

B6002	405 003 7603	TR 2SA1345-AC
OR	405 000 2205	TR DTA144ES-DCTP
OR	405 063 9104	TR DTA144EL-TL2
B6003	405 018 2501	TR 2SC3399-AC
OR	405 000 6104	TR DTC144ES-DCTP
C6006	403 125 5606	ELECT 100U M 16V
C6008	403 109 6308	ELECT 1U M 50V
C6009	403 135 7409	ELECT 22U M 50V
C6010	403 121 9509	CERAMIC 0.1U Z 50V
IC601	409 026 8203	IC L5631
OR	409 057 5103	IC UPC574J
IC602	409 148 5005	IC M6M80021P
Q6002	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
OR	405 093 0508	TR KSA1175-Y
Q6003	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 093 0607	TR KSC2785-Y
R6001	401 018 2701	CARBON 330 JA 1/4W
R6002	401 019 0904	CARBON 390 JA 1/4W
R6006	401 019 3905	CARBON 390K JA 1/4W
R6007	401 016 8705	CARBON 240K JA 1/4W
R6008	401 012 5609	CARBON 1K JA 1/4W
R6010	401 012 6903	CARBON 10K JA 1/4W
R6014	401 015 9406	CARBON 2K JA 1/4W (VR 3731 VPS ONLY)
R6015	401 012 6903	CARBON 10K JA 1/4W

RF CONVERTER CIRCUIT(CV-A)

C6601	403 134 8100	ELECT 100U M 6.3V
L6601	613 015 6631	COIL.INDUCTOR 15UHK
OR	613 014 8667	HF CHOKE
L6602	613 015 6631	COIL.INDUCTOR 15UHK
OR	613 014 8667	HF CHOKE

LOCATION	PARTS NO.	DESCRIPTION

COMPL,VD-1

COMPL.NO.	613 108 4186	
B1701	405 018 2402	TR 2SC3398-TB
OR	405 000 2908	TR DTC114EK-T96
C1701	403 069 5601	CERAMIC 0.01U K 50V
C1702	403 009 5807	CERAMIC 100P J 50V
C1703	403 189 2405	ELECT 10U M 16V
C1704	403 068 0409	CERAMIC 0.1U Z 25V
C1705	403 189 2405	ELECT 10U M 16V
C1706	403 069 5601	CERAMIC 0.01U K 50V
D1701	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
IC171	409 003 4907	IC BA7025L
J1701	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
Q1701	405 014 4400	TR 2SC2412K-T96-Q
OR	405 014 4509	TR 2SC2412K-T96-R
OR	405 014 4608	TR 2SC2412K-T96-S
OR	405 015 8407	TR 2SC2812-L5-TB
OR	405 015 8704	TR 2SC2812-L6-TB
R1701	401 038 0800	MT-GLAZE 22K JA 1/10W
R1702	401 037 5608	MT-GLAZE 10K JA 1/10W
R1703	401 038 7700	MT-GLAZE 5.6K JA 1/10W
R1704	401 037 5400	MT-GLAZE 1K JA 1/10W
R1705	401 038 0800	MT-GLAZE 22K JA 1/10W
R1706	401 037 5400	MT-GLAZE 1K JA 1/10W
R1707	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R1708	401 037 8104	MT-GLAZE 150K JA 1/10W
R1709	401 038 5805	MT-GLAZE 430 JA 1/10W
R1710	401 038 0800	MT-GLAZE 22K JA 1/10W
R1711	401 037 5608	MT-GLAZE 10K JA 1/10W
XF171	613 084 1681	FILTER 4.16MHZ B.F
XF172	613 015 8604	CHOKE COIL

COMPL,VP-1

COMPL.NO.	613 114 8093	
B1801	405 063 9708	TR DTC144EL-TL2
C1801	403 003 1805	CERAMIC 2200P M 25V
C1802	403 003 7104	CERAMIC 0.033U M 25V
C1803	403 003 7104	CERAMIC 0.033U M 25V
C1804	403 003 1805	CERAMIC 2200P M 25V
C1805	403 003 1805	CERAMIC 2200P M 25V
C1806	403 003 7104	CERAMIC 0.033U M 25V
C1807	403 022 7703	CERAMIC 33P J 50V
C1808	403 003 7104	CERAMIC 0.033U M 25V
C1809	403 003 1805	CERAMIC 2200P M 25V
C1810	403 012 6006	CERAMIC 15P J 50V
C1811	403 191 8709	ELECT 1U M 50V
C1812	403 003 7104	CERAMIC 0.033U M 25V
C1813	403 003 7104	CERAMIC 0.033U M 25V
C1814	403 163 7907	ELECT 47U M 6.3V
C1815	403 001 1906	CERAMIC 0.01U M 16V
C1816	403 069 0309	CERAMIC 1000P J 50V
C1817	403 163 7907	ELECT 47U M 6.3V
C1818	403 001 1906	CERAMIC 0.01U M 16V
C1819	403 001 1906	CERAMIC 0.01U M 16V
C1820	403 001 1906	CERAMIC 0.01U M 16V
C1821	403 001 1906	CERAMIC 0.01U M 16V
C1822	403 001 1906	CERAMIC 0.01U M 16V
C1823	403 072 7500	CERAMIC 330P J 50V

LOCATION	PARTS NO.	DESCRIPTION
C1824	403 073 2702	CERAMIC 390P J 50V
C1825	403 003 7104	CERAMIC 0.033U M 25V
C1826	403 193 7809	ELECT 100U M 16V
C1827	403 003 3700	CERAMIC 0.022U Z 25V
C1861	403 009 1809	CERAMIC 10P J 50V
C1862	403 028 3402	CERAMIC 56P J 50V
C1863	403 028 3402	CERAMIC 56P J 50V
C1864	403 150 1703	CERAMIC 91P J 50V
IC181	409 161 9806	IC LA7321
L1801	613 015 6730	COIL,INDUCTOR 100UHK
L1802	613 015 6730	COIL,INDUCTOR 100UHK
L1803	613 014 0838	COIL,INDUCTOR 6.8UHK
L1804	613 014 0890	COIL,INDUCTOR 22UHK
L1805	613 014 0968	COIL,INDUCTOR 82UHK
L1806	613 015 6716	COIL,INDUCTOR 68UHK
R1801	401 021 7007	CARBON 6.8 JA 1/4W
R1802	401 016 1409	CARBON 22 JA 1/4W
R1803	401 016 2505	CARBON 220 JA 1/4W
R1804	401 015 2605	CARBON 1.8K JA 1/4W
R1809	401 020 0702	CARBON 470 JA 1/4W
R1810	401 021 1807	CARBON 560 JA 1/4W
R1811	401 020 0702	CARBON 470 JA 1/4W
R1860	401 016 2505	CARBON 220 JA 1/4W
R1862	401 015 8805	CARBON 200 JA 1/4W
R1881	401 021 7007	CARBON 6.8 JA 1/4W
R1882	401 012 5609	CARBON 1K JA 1/4W
VR181	613 002 0345	SEMI VR 1KB
VR182	613 002 0345	SEMI VR 1KB

COMPL,SY-7

LOCATION	PARTS NO.	DESCRIPTION
COMPL.NO.	613 109 4550	
B3102	405 018 2402	TR 2SC3398-TB
B3104	405 018 2402	TR 2SC3398-TB
C3102	403 191 8808	ELECT 2.2U M 50V
C3103	403 068 0409	CERAMIC 0.1U Z 25V
C3104	403 069 5601	CERAMIC 0.01U K 50V
C3105	403 167 6500	ELECT 33U M 6.3V
C3106	403 068 0409	CERAMIC 0.1U Z 25V
C3108	403 163 7907	ELECT 47U M 6.3V
C3109	403 069 5601	CERAMIC 0.01U K 50V
C3110	403 013 3004	CERAMIC 150P J 50V
C3111	403 069 5601	CERAMIC 0.01U K 50V
C3112	403 069 5601	CERAMIC 0.01U K 50V
C3113	403 069 5601	CERAMIC 0.01U K 50V
C3114	403 069 5601	CERAMIC 0.01U K 50V
C3115	403 155 9407	NP-ELECT 10U M 25V
C3116	403 069 1702	CERAMIC 1000P K 50V
C3117	403 069 5601	CERAMIC 0.01U K 50V
C3118	403 069 5601	CERAMIC 0.01U K 50V
D3101	407 063 9504	ZENER DIODE MTZJ8.2B-T-77
D3102	407 099 5303	ZENER DIODE MTZJ5.6B-T-77
D3103	407 003 3609	DIODE DAN202K-T-96
D3104	407 003 3609	DIODE DAN202K-T-96
IC311	409 168 2503	IC BA10393F
IC312	409 114 4803	IC LB1641
IC313	409 032 3704	IC MN1280-R
OR	409 032 3803	IC MN1280-S
L3101	613 014 1118	COIL,INDUCTOR 18UHJ
Q3101	405 015 9909	TR 2SC2814-F5-TB
Q3101	405 035 6100	TR 2SC2413K-T96-Q
Q3102	405 015 8902	TR 2SC2812-L7-TB
OR	405 014 4608	TR 2SC2412K-T96-S
Q3103	405 015 8902	TR 2SC2812-L7-TB
OR	405 014 4608	TR 2SC2412K-T96-S
R3101	401 037 5608	MT-GLAZE 10K JA 1/10W
R3102	401 037 8104	MT-GLAZE 150K JA 1/10W
R3103	401 038 0206	MT-GLAZE 20K JA 1/10W
R3104	401 038 0800	MT-GLAZE 22K JA 1/10W
R3105	401 038 7809	MT-GLAZE 56K JA 1/10W
R3106	401 039 0601	MT-GLAZE 820K JA 1/10W
R3107	401 038 2309	MT-GLAZE 270K JA 1/10W
R3108	401 038 2200	MT-GLAZE 27K JA 1/10W
R3109	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R3110	401 038 3702	MT-GLAZE 33K JA 1/10W
R3111	401 038 0800	MT-GLAZE 22K JA 1/10W
R3112	401 037 5608	MT-GLAZE 10K JA 1/10W
R3113	401 038 0800	MT-GLAZE 22K JA 1/10W
R3114	401 037 5608	MT-GLAZE 10K JA 1/10W
R3115	401 037 5608	MT-GLAZE 10K JA 1/10W
R3116	401 037 5608	MT-GLAZE 10K JA 1/10W
R3117	401 037 7909	MT-GLAZE 1.5K JA 1/10W
R3118	401 038 9605	MT-GLAZE 750 JA 1/10W
R3123	401 039 0403	MT-GLAZE 8.2K JA 1/10W
R3124	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R3125	401 037 5400	MT-GLAZE 1K JA 1/10W
R3126	401 038 3504	MT-GLAZE 330 JA 1/10W
R3127	401 038 0602	MT-GLAZE 220 JA 1/10W
R3128	401 038 0602	MT-GLAZE 220 JA 1/10W
R3129	401 038 0909	MT-GLAZE 220K JA 1/10W
R3130	401 038 2200	MT-GLAZE 27K JA 1/10W
R3131	401 038 3702	MT-GLAZE 33K JA 1/10W
R3132	401 038 3702	MT-GLAZE 33K JA 1/10W
R3133	401 038 6505	MT-GLAZE 47K JA 1/10W
R3134	401 038 3702	MT-GLAZE 33K JA 1/10W
R3135	401 037 8203	MT-GLAZE 1.5M JA 1/10W
R3136	401 038 0800	MT-GLAZE 22K JA 1/10W
R3137	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R3138	401 037 5400	MT-GLAZE 1K JA 1/10W
R3139	401 038 0305	MT-GLAZE 200K JA 1/10W
R3140	401 037 5400	MT-GLAZE 1K JA 1/10W
R3141	401 038 0305	MT-GLAZE 200K JA 1/10W
R3142	401 037 5400	MT-GLAZE 1K JA 1/10W
R3143	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R3144	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R3145	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R3146	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R3152	401 037 7909	MT-GLAZE 1.5K JA 1/10W
R3153	401 037 5400	MT-GLAZE 1K JA 1/10W
R3154	401 037 5400	MT-GLAZE 1K JA 1/10W
R3155	401 037 5400	MT-GLAZE 1K JA 1/10W
R3156	401 037 5400	MT-GLAZE 1K JA 1/10W

COMPL,PW-1

LOCATION	PARTS NO.	DESCRIPTION
COMPL.NO.	613 109 4505	(VR 3731 VPS)
COMPL.NO.	613 109 4512	(VR 3731,VR 3731 LX)
C5101	403 110 1705	ELECT 2200U M 25V
OR	403 148 0701	ELECT 2200U M 25V
C5102	403 110 1705	ELECT 2200U M 25V
OR	403 148 0701	ELECT 2200U M 25V
C5103	403 160 6804	ELECT 3300U M 16V
OR	403 158 0500	ELECT 3300U M 16V
C5104	403 157 0006	ELECT 47U M 63V
C5105	403 195 5100	ELECT 47U M 100V
OR	403 155 5805	ELECT 47U M 100V
C5106	403 168 6103	MT-POLYEST 0.1U J 50V
C5107	403 135 9403	ELECT 47U M 35V

LOCATION	PARTS NO.	DESCRIPTION
C5108	403 107 9905	ELECT 10U M 16V
C5109	403 107 9905	ELECT 10U M 16V
C5110	403 107 9905	ELECT 10U M 16V
D5101	407 004 9600	DIODE DSF10TC-BT
D5102	407 004 9600	DIODE DSF10TC-BT
D5103	407 132 7400	DIODE GP30DL-6326
D5104	407 132 7400	DIODE GP30DL-6326
D5105	407 004 9709	DIODE DSK10C-BT
OR	407 088 6502	DIODE MPG06D-PKG3
OR	407 005 8701	DIODE ERA15-02-V5
D5106	407 004 9709	DIODE DSK10C-BT
OR	407 088 6502	DIODE MPG06D-PKG3
OR	407 005 8701	DIODE ERA15-02-V5
D5107	407 004 9709	DIODE DSK10C-BT
OR	407 088 6502	DIODE MPG06D-PKG3
OR	407 005 8701	DIODE ERA15-02-V5
D5108	407 004 9709	DIODE DSK10C-BT
OR	407 088 6502	DIODE MPG06D-PKG3
OR	407 005 8701	DIODE ERA15-02-V5
D5109	407 078 2705	DIODE 1SS244-T-77
D5110	407 078 2705	DIODE 1SS244-T-77
F5001 ⚠	423 004 6708	FUSE 250V0.315A
F5101 ⚠	423 004 3004	FUSE 250V 0.8A
F5102 ⚠	423 005 4901	FUSE 250V 1.6A
F5103 ⚠	423 006 1305	FUSE 250V 2A
F5104 ⚠	423 004 6708	FUSE 250V0.315A
L5001 ⚠	613 080 0664	LF CHOKE(VR 3731 VPS ONLY)
OR ⚠	613 013 1409	LF CHOKE(VR 3731 VPS ONLY)
R5101	401 007 8301	CARBON 1.5K JA 1/2W
R5102	401 007 8301	CARBON 1.5K JA 1/2W
Y5112	613 041 5967	COVER,F5001,F5103

COMPL,PW-2

COMPL.NO.	613 109 4529	
IC521	409 214 4208	IC STK5446

COMPL,TN-7

COMPL.NO.	613 109 4420	
B6901	405 018 1900	TR 2SC3395-TB
OR	405 029 3504	TR DTC144EK-T96
C6901	403 068 0409	CERAMIC 0.1U Z 25V
C6902	403 189 2405	ELECT 10U M 16V
C6903	403 072 3403	CERAMIC 0.022U Z 50V
C6904	403 193 8400	ELECT 0.22U M 50V
D6901	407 004 0706	DIODE DCB015-TB
OR	407 003 3609	DIODE DAN202K-T-96
D6902	407 003 5108	DIODE DA204K-T96
J6901	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
Q6901	405 015 8308	TR 2SC2812-L4-TB
OR	405 015 8407	TR 2SC2812-L5-TB
OR	405 014 4400	TR 2SC2412K-T96-Q
OR	405 014 4509	TR 2SC2412K-T96-R
Q6902	405 030 7201	TR 2SA1338-4-TB
OR	405 030 7300	TR 2SA1338-5-TB
Q6903	405 015 8308	TR 2SC2812-L4-TB
OR	405 015 8407	TR 2SC2812-L5-TB
OR	405 014 4400	TR 2SC2412K-T96-Q
OR	405 014 4509	TR 2SC2412K-T96-R

LOCATION	PARTS NO.	DESCRIPTION
R6901	401 037 5400	MT-GLAZE 1K JA 1/10W
R6902	401 038 3504	MT-GLAZE 330 JA 1/10W
R6903	401 038 8509	MT-GLAZE 620 JA 1/10W
R6904	401 037 5608	MT-GLAZE 10K JA 1/10W
R6905	401 038 3801	MT-GLAZE 330K JA 1/10W
R6906	401 037 5608	MT-GLAZE 10K JA 1/10W
R6907	401 038 3603	MT-GLAZE 3.3K JA 1/10W
R6908	401 039 0205	MT-GLAZE 82 JA 1/10W
R6909	401 037 5400	MT-GLAZE 1K JA 1/10W
R6910	401 038 7106	MT-GLAZE 510 JA 1/10W
R6911	401 038 7700	MT-GLAZE 5.6K JA 1/10W
R6912	401 038 5102	MT-GLAZE 3.9K JA 1/10W
T6901	613 109 0958	TRANS.IF
OR	613 109 0965	TRANS.IF

COMPL,TM-1

COMPL.NO.	613 111 3190	
	613 077 3203	HOLDER, TUBE
A7101	613 084 3203	FLUORESCENT TUBE
C7101	403 007 8503	CERAMIC 1.5P M 50V
C7102	403 014 2501	CERAMIC 18P J 50V
C7103	403 017 0108	CERAMIC 20P J 50V
C7104	403 001 1609	CERAMIC 0.01U K 16V
C7105	403 139 1601	ELECT 22U M 16V
C7106	403 001 1609	CERAMIC 0.01U K 16V
C7107	403 001 1609	CERAMIC 0.01U K 16V
C7108	403 139 2608	ELECT 0.47U M 50V
C7111	403 121 9509	CERAMIC 0.1U Z 50V
C7113	403 139 1502	ELECT 10U M 16V
D7101	407 120 5807	DIODE AK04-V2
D7103	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D7104	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D7105	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D7107	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D7108	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D7110	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D7120	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D7125	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
IC711	409 214 4000	IC M50959-292SP
IC712	409 032 3308	IC MN1280-L
R7101	401 012 9201	CARBON 1M JA 1/4W
R7102	401 110 6201	CARBON 10M JA 1/4W
R7103	401 018 5702	CARBON 330K JA 1/4W
R7104	401 012 5609	CARBON 1K JA 1/4W
R7105	401 012 6903	CARBON 10K JA 1/4W
R7106	401 012 5609	CARBON 1K JA 1/4W
R7107	401 012 6903	CARBON 10K JA 1/4W
R7108	401 012 5609	CARBON 1K JA 1/4W
R7109	401 012 6903	CARBON 10K JA 1/4W
R7110	401 012 5609	CARBON 1K JA 1/4W
R7111	401 012 6903	CARBON 10K JA 1/4W
R7112	401 012 6903	CARBON 10K JA 1/4W
R7114	401 012 6903	CARBON 10K JA 1/4W
R7115	401 012 6903	CARBON 10K JA 1/4W

LOCATION	PARTS NO.	DESCRIPTION
R7116	401 016 4707	CARBON 22K JA 1/4W
R7117	401 012 6903	CARBON 10K JA 1/4W
R7118	401 012 5609	CARBON 1K JA 1/4W
R7119	401 012 5609	CARBON 1K JA 1/4W
R7121	401 012 6903	CARBON 10K JA 1/4W
R7122	401 012 5609	CARBON 1K JA 1/4W
R7123	401 012 5609	CARBON 1K JA 1/4W
R7124	401 018 4804	CARBON 33K JA 1/4W
R7126	401 012 6903	CARBON 10K JA 1/4W
R7127	401 012 6903	CARBON 10K JA 1/4W
R7132	401 012 6903	CARBON 10K JA 1/4W
R7133	401 018 5702	CARBON 330K JA 1/4W
RR711	613 094 0421	IR RECEIVER PACK
S7106	613 079 4154	SW,PUSH,UP
OR	613 077 4354	PUSH SWITCH,UP
OR	613 092 0768	SW,PUSH,UP
OR	613 092 0744	SW,PUSH,UP
S7108	613 079 4154	SW,PUSH,TR+
OR	613 077 4354	PUSH SWITCH,TR+
OR	613 092 0768	SW,PUSH,TR+
OR	613 092 0744	SW,PUSH,TR+
S7114	613 079 4130	SW,PUSH,EJECT
OR	613 006 3649	PUSH SWITCH,EJECT
OR	613 092 0751	SW,PUSH,EJECT
OR	613 092 1734	SW,PUSH,EJECT
S7118	613 079 4154	SW,PUSH,DOWN
OR	613 077 4354	PUSH SWITCH,DOWN
OR	613 092 0768	SW,PUSH,DOWN
OR	613 092 0744	SW,PUSH,DOWN
S7120	613 079 4154	SW,PUSH,TR-
OR	613 077 4354	PUSH SWITCH,TR-
OR	613 092 0768	SW,PUSH,TR-
OR	613 092 0744	SW,PUSH,TR-
S7129	613 079 4154	SW,PUSH,PRESET
OR	613 077 4354	PUSH SWITCH,PRESET
OR	613 092 0768	SW,PUSH,PRESET
OR	613 092 0744	SW,PUSH,PRESET
S7130	613 079 4154	SW,PUSH,OK
OR	613 077 4354	PUSH SWITCH,OK
OR	613 092 0768	SW,PUSH,OK
OR	613 092 0744	SW,PUSH,OK
S7137	613 079 4154	SW,PUSH,ALL CLEAR
OR	613 077 4354	PUSH SWITCH,ALL CLEAR
OR	613 092 0768	SW,PUSH,ALL CLEAR
OR	613 092 0744	SW,PUSH,ALL CLEAR
X7101	613 089 4069	RESONATOR,CERAMIC 6MHZ
OR	613 108 9570	RESONATOR,CERAMIC 6MHZ
X7102	613 109 0972	OSC,CRYSTAL 32KHZ

COMPL,TM-2

LOCATION	PARTS NO.	DESCRIPTION
COMPL.NO.	613 110 1814	
S7101	613 079 4130	SW,PUSH,PLAY
OR	613 006 3649	PUSH SWITCH,PLAY
OR	613 092 0751	SW,PUSH,PLAY
OR	613 092 1734	SW,PUSH,PLAY
S7102	613 079 4130	SW,PUSH,STOP
OR	613 006 3649	PUSH SWITCH,STOP
OR	613 092 0751	SW,PUSH,STOP
OR	613 092 1734	SW,PUSH,STOP
S7103	613 079 4154	SW,PUSH,PAUSE
OR	613 077 4354	PUSH SWITCH,PAUSE
OR	613 092 0768	SW,PUSH,PAUSE
OR	613 092 0744	SW,PUSH,PAUSE
S7113	613 079 4154	SW,PUSH,REC
OR	613 077 4354	PUSH SWITCH,REC

LOCATION	PARTS NO.	DESCRIPTION
S7113	613 092 0768	SW,PUSH,REC
OR	613 092 0744	SW,PUSH,REC
S7115	613 079 4130	SW,PUSH,POWER
OR	613 006 3649	PUSH SWITCH,POWER
OR	613 092 0751	SW,PUSH,POWER
OR	613 092 1734	SW,PUSH,POWER
S7125	613 079 4154	SW,PUSH,REW
OR	613 077 4354	PUSH SWITCH,REW
OR	613 092 0768	SW,PUSH,REW
OR	613 092 0744	SW,PUSH,REW
S7126	613 079 4154	SW,PUSH,FF
OR	613 077 4354	PUSH SWITCH,FF
OR	613 092 0768	SW,PUSH,FF
OR	613 092 0744	SW,PUSH,FF

COMPL,TM-8,VPS PCB

LOCATION	PARTS NO.	DESCRIPTION
COMPL.NO.	613 108 5534	(VR 3731 VPS ONLY)
COMPL.NO.		(VR 3731 LX OPTION)
C7802	403 013 3103	CERAMIC 150P J 50V
C7803	403 067 7300	MT-COMPO 0.33U J 50V
OR	403 115 1007	MT-POLYEST 0.33U J 63V
OR	403 168 6202	MT-POLYEST 0.33U J 50V
C7804	403 057 2407	POLYESTER 0.1U J 50V
C7805	403 068 0409	CERAMIC 0.1U Z 25V
C7806	403 193 7502	ELECT 22U M 6.3V
IC781	409 148 5104	IC SDA5642
Q7801	405 015 8407	TR 2SC2812-L5-TB
OR	405 015 8704	TR 2SC2812-L6-TB
OR	405 014 4400	TR 2SC2412K-T96-Q
OR	405 014 4509	TR 2SC2412K-T96-R
R7801	401 038 6307	MT-GLAZE 470 JA 1/10W
R7802	401 037 5400	MT-GLAZE 1K JA 1/10W
R7803	401 037 5400	MT-GLAZE 1K JA 1/10W
R7804	401 037 9101	MT-GLAZE 180 JA 1/10W
R7805	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R7806	401 037 5806	MT-GLAZE 1M JA 1/10W
R7807	401 039 0601	MT-GLAZE 820K JA 1/10W
R7808	401 037 5707	MT-GLAZE 100K JA 1/10W
R7809	401 037 5608	MT-GLAZE 10K JA 1/10W
R7810	401 037 7008	MT-GLAZE 1.2M JA 1/10W
R7811	401 037 5202	MT-GLAZE 100 JA 1/10W
R7812	401 038 7700	MT-GLAZE 5.6K JA 1/10W

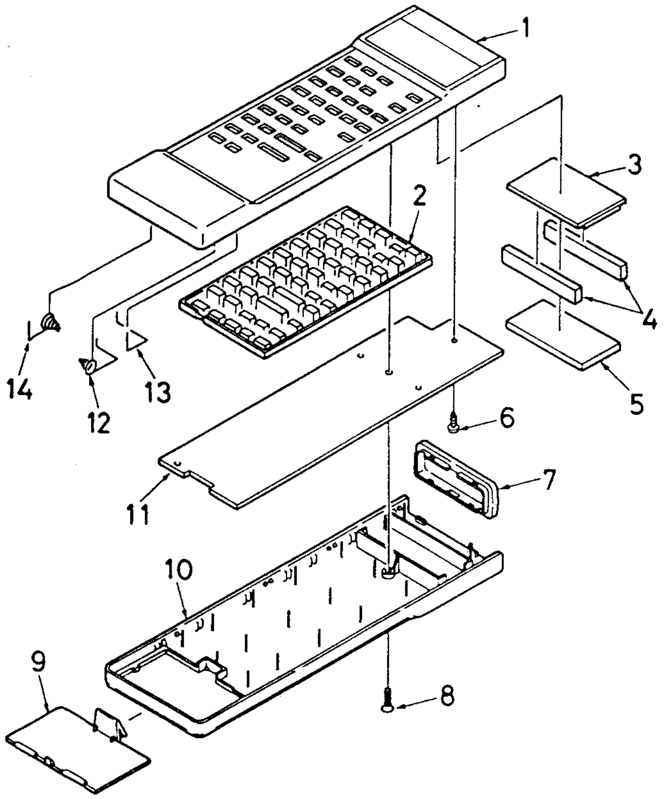
COMPL,TB-1

LOCATION	PARTS NO.	DESCRIPTION
COMPL.NO.	613 111 3145	(VR 3731 VPS)
COMPL.NO.	613 109 4444	(VR 3731,VR 3731 LX)
B8611	405 018 2501	TR 2SC3399-AC
OR	405 000 6104	TR DTC144ES-DCTP
C8521	403 069 1207	CERAMIC 1000P K 50V (VR 3731 VPS ONLY)
C8522	403 069 1207	CERAMIC 1000P K 50V (VR 3731 VPS ONLY)
C8601	403 139 1007	ELECT 47U M 6.3V
C8602	403 139 1007	ELECT 47U M 6.3V
C8603	403 139 1007	ELECT 47U M 6.3V
C8604	403 001 1906	CERAMIC 0.01U M 16V
C8699	403 068 9402	CERAMIC 100P K 50V (VR 3731 VPS ONLY)
D8601	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D8602	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT

LOCATION	PARTS NO.	DESCRIPTION
D8611	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D8612	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
IC861	409 003 4501	IC BA7021
OR	409 120 3401	IC LA7221
L8521	613 014 0739	COIL,INDUCTOR 1.0UHM (VR 3731 VPS ONLY)
OR	613 014 4256	HF CHOKE(VR 3731 VPS ONLY)
Q8611	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
OR	405 093 0508	TR KSA1175-Y
R8501	401 017 1705	CARBON 2.7K JA 1/4W
R8502	401 017 1705	CARBON 2.7K JA 1/4W
R8503	401 012 5609	CARBON 1K JA 1/4W
R8504	401 014 8509	CARBON 1.6K JA 1/4W
R8602	401 020 2805	CARBON 47K JA 1/4W
R8603	401 012 6903	CARBON 10K JA 1/4W
R8604	401 020 2805	CARBON 47K JA 1/4W
R8605	401 022 6702	CARBON 75 JA 1/4W
R8606	401 020 1907	CARBON 4.7K JA 1/4W
R8611	401 012 6903	CARBON 10K JA 1/4W
R8612	401 012 5609	CARBON 1K JA 1/4W
R8613	401 021 2903	CARBON 5.6K JA 1/4W
R8614	401 021 2903	CARBON 5.6K JA 1/4W
R8615	401 016 4707	CARBON 22K JA 1/4W
R8616	401 021 0602	CARBON 56 JA 1/4W
VR361	613 097 0572	VR,ROTARY 100KB

REMOCON,RC231

LOCATION	PARTS NO.	DESCRIPTION
COMPL.NO.	613 111 4203	(VR 3731 LX)
COMPL.NO.	613 111 4180	(VR 3731,VR 3731 VPS)
1	613 112 4516	ASSY,CABINET,TOP(VR 3731,VR 3731 VPS)
OR	613 112 4523	ASSY,CABINET,TOP(VR 3731 LX)
2	613 112 3762	BUTTON(VR 3731,VR 3731 VPS)
OR	613 112 3755	BUTTON(VR 3731 LX)
3	613 087 0087	LCD
4	613 080 9520	CONNECTOR
5	613 080 9728	SPACER
6	411 022 7807	SCR S-TPG PAN 2X6
7	613 080 9681	SIGN WINDOW
8	411 101 7308	SCR S-TPG FLT 2.6X10
9	613 040 1724	BATTERY LID
10	613 040 0727	BOTTOM LID
11	613 110 1128	COMPL,RM-1
12	613 080 9759	TERMINAL,-(INCLUDE RM-1)
13	613 080 9742	TERMINAL,+(INCLUDE RM-1)
14	613 080 9735	TERMINAL



COMPL,RM-1

LOCATION	PARTS NO.	DESCRIPTION
COMPL.NO.	613 110 1128	
C1	403 068 0409	CERAMIC 0.1U Z 25V
C2	403 049 0800	ELECT 1U M 50V
C3	613 087 2043	CAP,TRIM 20P
C4	403 068 0409	CERAMIC 0.1U Z 25V
C5	403 068 0409	CERAMIC 0.1U Z 25V
C6	403 068 0409	CERAMIC 0.1U Z 25V
C7	403 038 1603	ELECT 100U M 6.3V
IC1	409 218 2309	IC LC5863H-1120
IC2	409 129 3402	IC UPD74HC08G
OR	409 208 1909	IC MLC74HC08AM
OR	409 221 3102	IC MC74HC08AF
LED1	407 040 3709	LED SLR-932A
Q1	405 021 2406	TR 2SD1048-X7-TB
OR	405 021 2505	TR 2SD1048-X8-TB
R1	401 037 5202	MT-GLAZE 100 JA 1/10W
R2	401 015 6405	CARBON 2.2 JA 1/4W
R3	401 037 5202	MT-GLAZE 100 JA 1/10W
R5	401 039 0601	MT-GLAZE 820K JA 1/10W
X1	613 082 8156	OSC,CRYSTAL 38.2293KHZ

ITT NOKIA VR 3731

VR 3731 VPS

LUXOR VR 3731 LX

BLOCK DIAGRAMS, CIRCUIT DIAGRAMS & PRINTED CIRCUIT BOARDS

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6611 77 09
(611) SA

NOTES:

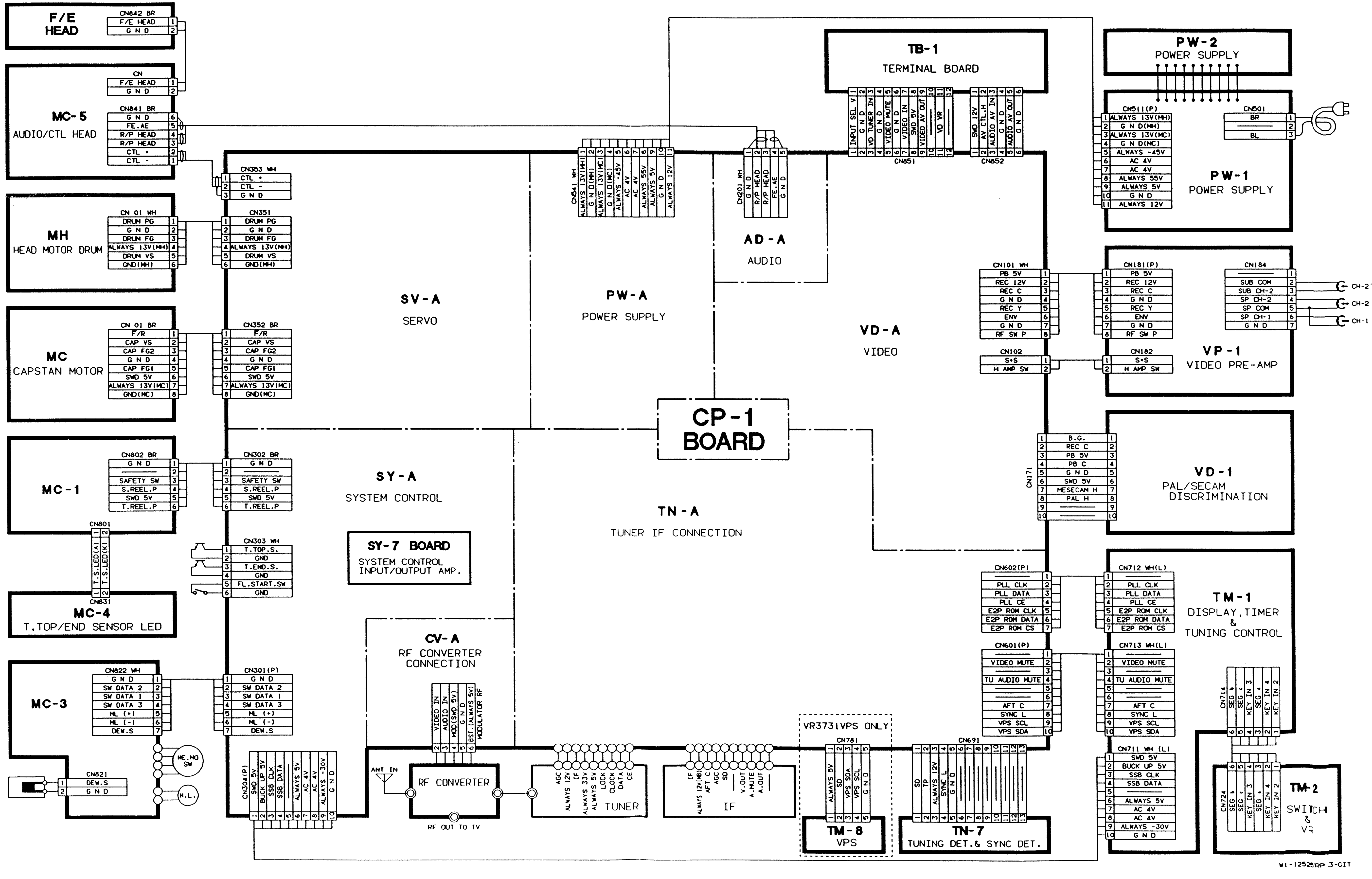
1. All resistance values in "OHMS" unless otherwise noted. (K=1,000 M=1,000,000)
2. All capacitance values in "μfd" unless otherwise noted. p=pico farad
3. All inductance values in "mH" unless otherwise noted. μ=micro henry

PRODUCT SAFETY NOTICE

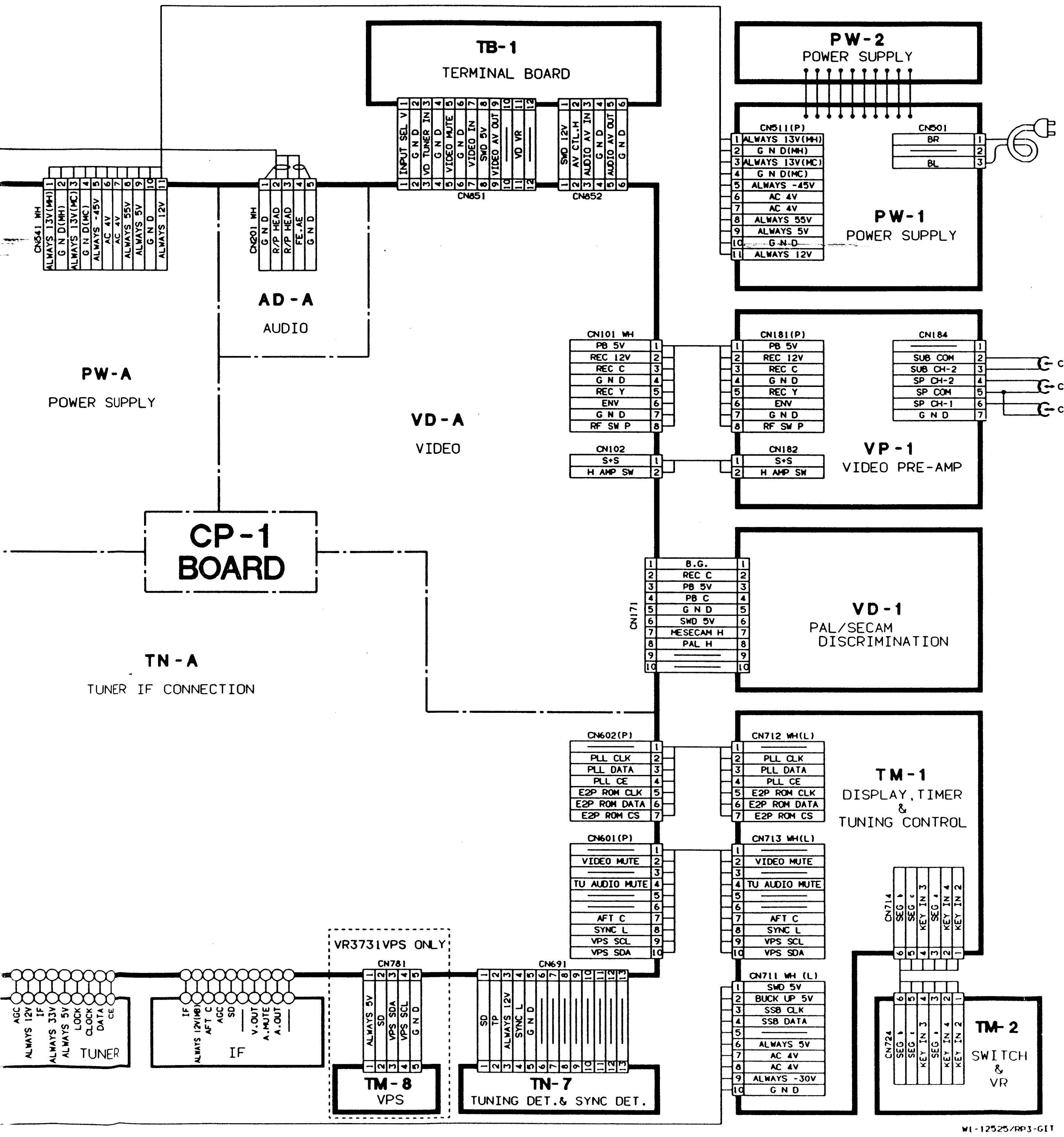
THE COMPONENTS DESIGNATED BY A SYMBOL (⚠) IN THIS SCHEMATIC DIAGRAM DESIGNATES COMPONENTS WHOSE VALUE ARE OF SPECIAL SIGNIFICANCE TO PRODUCT SAFETY. SHOULD ANY COMPONENT DESIGNATED BY A SIMBOL NEED TO BE REPLACED, USE ONLY THE PART DESIGNATED IN THE PARTS LIST. DO NOT DEVIATE FROM THE RESISTANCE, WATTAGE AND VOLTAGE RATINGS SHOWN.

1. BLOCK DIAGRAM

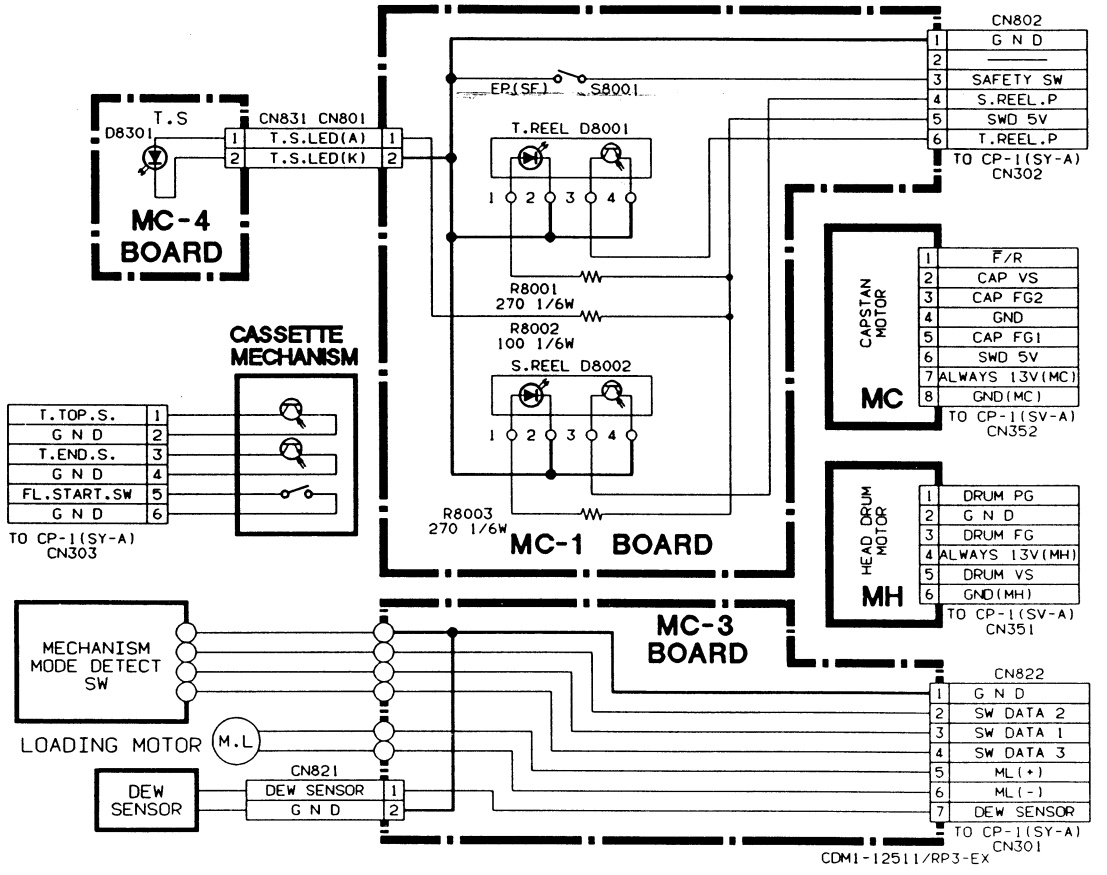
1-1. OVERALL WIRING DIAGRAM


F/E HEAD
CN842 BR
F/E HEAD
G N D
MC-5
AUDIO/CTL HEAD
CN
F/E HEAD
G N D
CN841 BR
G N D
FE.AE
R/P HEAD
R/P HEAD
CTL +
CTL -
MH
HEAD MOTOR DRUM
CN 01 WH
DRUM PG
G N D
DRUM FG
ALWAYS 13V(MH)
DRUM VS
GND(MH)
MC
CAPSTAN MOTOR
CN 01 BR
F/R
CAP VS
CAP FG2
G N D
CAP FG1
SWD 5V
ALWAYS 13V(MC)
GND(MC)
MC-1
CN802 BR
G N D
SAFETY SW
S.REEL.P
SWD 5V
T.REEL.P
CN801
T.S.LED(A)
T.S.LED(K)
CN831
MC-4
T.TOP/END SENSOR LED
MC-3
CN822 WH
G N D
SW DATA 2
SW DATA 1
SW DATA 3
ML (+)
ML (-)
DEW.S
ME.MO SW
M.L.
CN821
DEW.S
G N D
CN353 WH
CTL +
CTL -
G N D
CN351
DRUM PG
G N D
DRUM FG
ALWAYS 13V(MH)
DRUM VS
GND(MH)
CN352 BR
F/R
CAP VS
CAP FG2
G N D
CAP FG1
SWD 5V
ALWAYS 13V(MC)
GND(MC)
CN302 BR
G N D
SAFETY SW
S.REEL.P
SWD 5V
T.REEL.P
CN303 WH
T.TOP.S.
GND
T.END.S.
GND
FL.START.SW
GND
CN301(P)
G N D
SW DATA 2
SW DATA 1
SW DATA 3
ML (+)
ML (-)
DEW.S
SV-A
SERVO
PW-A
POWER SUPPLY
SY-A
SYSTEM CONTROL
SY-7 BOARD
SYSTEM CONTROL
INPUT/OUTPUT AMP.
CV-A
RF CONVERTER
CONNECTION
TN-A
TUNER IF CONNECTION
AD-A
AUDIO
VD-A
VIDEO
CP-1
BOARD
CN541 WH
ALWAYS 13V(MH)
G N D(MH)
ALWAYS 13V(MC)
G N D(MC)
ALWAYS -45V
AC 4V
AC 4V
ALWAYS 55V
ALWAYS 5V
G N D
ALWAYS 12V
CN201 WH
G N D
R/P HEAD
R/P HEAD
FE.AE
G N D
TB-1
TERMINAL BOARD
INPUT SEL V1
G N D
VD TUNER IN
G N D
VIDEO MUTE
G N D
VIDEO IN
SWD 5V
VIDEO AV OUT
VD VR
CN851
SWD 12V
AV CTL.H
AUDIO AV IN
G N D
AUDIO AV OUT
G N D
CN852
PW-2
POWER SUPPLY
PW-1
POWER SUPPLY
CN511(P)
ALWAYS 13V(MH)
G N D(MH)
ALWAYS 13V(MC)
G N D(MC)
ALWAYS -45V
AC 4V
AC 4V
ALWAYS 55V
ALWAYS 5V
G N D
ALWAYS 12V
CN501
BR
BL
CN101 WH
PB 5V
REC 12V
REC C
G N D
REC Y
ENV
G N D
RF SW P
CN102
S•S
H AMP SW
CN181(P)
PB 5V
REC 12V
REC C
G N D
REC Y
ENV
G N D
RF SW P
CN182
S•S
H AMP SW
CN184
SUB COM
SUB CH-2
SP CH-2
SP COM
SP CH-1
G N D
CH-2'
CH-2
CH-1
VP-1
VIDEO PRE-AMP
CN171
B.G.
REC C
PB 5V
PB C
G N D
SWD 5V
MESECAM H
PAL H
VD-1
PAL/SECAM
DISCRIMINATION
CN602(P)
PLL CLK
PLL DATA
PLL CE
E2P ROM CLK
E2P ROM DATA
E2P ROM CS
CN712 WH(L)
PLL CLK
PLL DATA
PLL CE
E2P ROM CLK
E2P ROM DATA
E2P ROM CS
TM-1
DISPLAY, TIMER
&
TUNING CONTROL
CN601(P)
VIDEO MUTE
TU AUDIO MUTE
AFT C
SYNC L
VPS SCL
VPS SDA
CN713 WH(L)
VIDEO MUTE
TU AUDIO MUTE
AFT C
SYNC L
VPS SCL
VPS SDA
CN711 WH (L)
SWD 5V
BUCK UP 5V
SSB CLK
SSB DATA
ALWAYS 5V
AC 4V
AC 4V
ALWAYS -30V
G N D
CN714
SEG ♦
SEG ♦
KEY IN 3
SEG ♦
KEY IN 2
CN724
SEG ♦
SEG ♦
KEY IN 3
SEG ♦
KEY IN 4
KEY IN 2
TM-2
SWITCH
&
VR
CN304(P)
SWD 5V
BUCK UP 5V
SSB CLK
SSB DATA
ALWAYS 5V
AC 4V
AC 4V
ALWAYS -30V
G N D
VIDEO IN
AUDIO IN
MOD(SWD 5V)
G N D
BST.(ALWAYS 5V)
MODULATOR RF
ANT IN
RF CONVERTER
RF OUT TO TV
AGC
ALWAYS 12V
ALWAYS 33V
ALWAYS 5V
LOCK
CLOCK
DATA
CE
TUNER
IF
ALWAYS 12V(MB)
AFT C
AGC
SD
V.OUT
A.MUTE
A.OUT
VR3731VPS ONLY
CN781
ALWAYS 5V
SD
VPS SDA
VPS SCL
G N D
TM-8
VPS
CN691
SD
TP
ALWAYS 12V
SYNC L
G N D
TN-7
TUNING DET.& SYNC DET.
WI-1252ORP 3-GIT

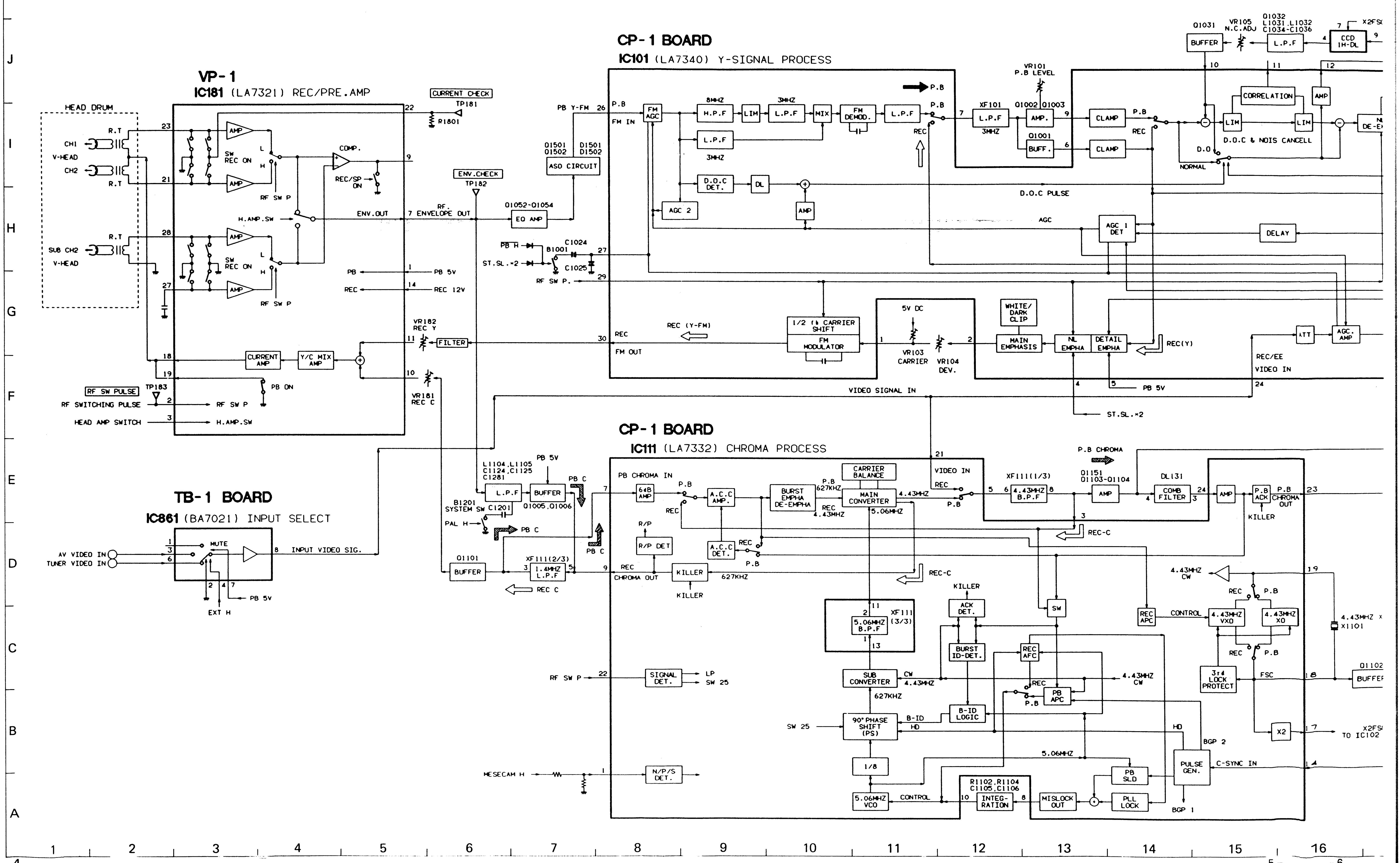
1-1. OVERALL WIRING DIAGRAM


TB-1
TERMINAL BOARD
PW-2
POWER SUPPLY
PW-1
POWER SUPPLY
CN511(P)
ALWAYS 13V(MH)
G N D(MH)
ALWAYS 13V(MC)
G N D(MC)
ALWAYS -45V
AC 4V
AC 4V
ALWAYS 55V
ALWAYS 5V
G N D
ALWAYS 12V
CN501
BR
BL
CN851
INPUT SEL V1
G N D
VD TUNER IN
G N D
VIDEO MUTE
G N D
VIDEO IN
SWD 5V
VIDEO AV OUT
G N D
VD VR
CN852
SWD 12V
AV CTL.H
AUDIO AV IN
G N D
AUDIO AV OUT
G N D
CN541 WH
ALWAYS 13V(MH)
G N D(MH)
ALWAYS 13V(MC)
G N D(MC)
ALWAYS -45V
AC 4V
AC 4V
ALWAYS 55V
ALWAYS 5V
G N D
ALWAYS 12V
CN201 WH
G N D
R/P HEAD
R/P HEAD
FE.AE
G N D
AD-A
AUDIO
PW-A
POWER SUPPLY
VD-A
VIDEO
CN101 WH
PB 5V
REC 12V
REC C
G N D
REC Y
ENV
G N D
RF SW P
CN102
S+S
H AMP SW
CN181(P)
PB 5V
REC 12V
REC C
G N D
REC Y
ENV
G N D
RF SW P
CN182
S+S
H AMP SW
CN184
SUB COM
SUB CH-2
SP CH-2
SP COM
SP CH-1
G N D
CH-2'
CH-2
CH-1
VP-1
VIDEO PRE-AMP
CP-1
BOARD
CN171
B.G.
REC C
PB 5V
PB C
G N D
SWD 5V
MESECAM H
PAL H
VD-1
PAL/SECAM
DISCRIMINATION
TN-A
TUNER IF CONNECTION
CN602(P)
PLL CLK
PLL DATA
PLL CE
E2P ROM CLK
E2P ROM DATA
E2P ROM CS
CN712 WH(L)
PLL CLK
PLL DATA
PLL CE
E2P ROM CLK
E2P ROM DATA
E2P ROM CS
TM-1
DISPLAY,TIMER
&
TUNING CONTROL
CN601(P)
VIDEO MUTE
TU AUDIO MUTE
AFT C
SYNC L
VPS SCL
VPS SDA
CN713 WH(L)
VIDEO MUTE
TU AUDIO MUTE
AFT C
SYNC L
VPS SCL
VPS SDA
CN714
SEG
SEG
KEY IN 3
SEG
KEY IN 4
KEY IN 2
VR3731VPS ONLY
CN781
ALWAYS 5V
SD
VPS SDA
VPS SCL
G N D
CN691
SD
TP
ALWAYS 12V
SYNC L
G N D
AGC
ALWAYS 12V
IF
ALWAYS 33V
ALWAYS 5V
LOCK
CLOCK
DATA
CE
TUNER
IF
ALWAYS 12V(MH)
AFT C
AGC
SD
V.OUT
A.MUTE
A.OUT
IF
TM-8
VPS
TN-7
TUNING DET.& SYNC DET.
CN711 WH (L)
SWD 5V
BUCK UP 5V
SSB CLK
SSB DATA
ALWAYS 5V
AC 4V
AC 4V
ALWAYS -30V
G N D
CN724
SEG
SEG
KEY IN 3
SEG
KEY IN 4
KEY IN 2
TM-2
SWITCH
&
VR
W1-12525/RP3-GIT

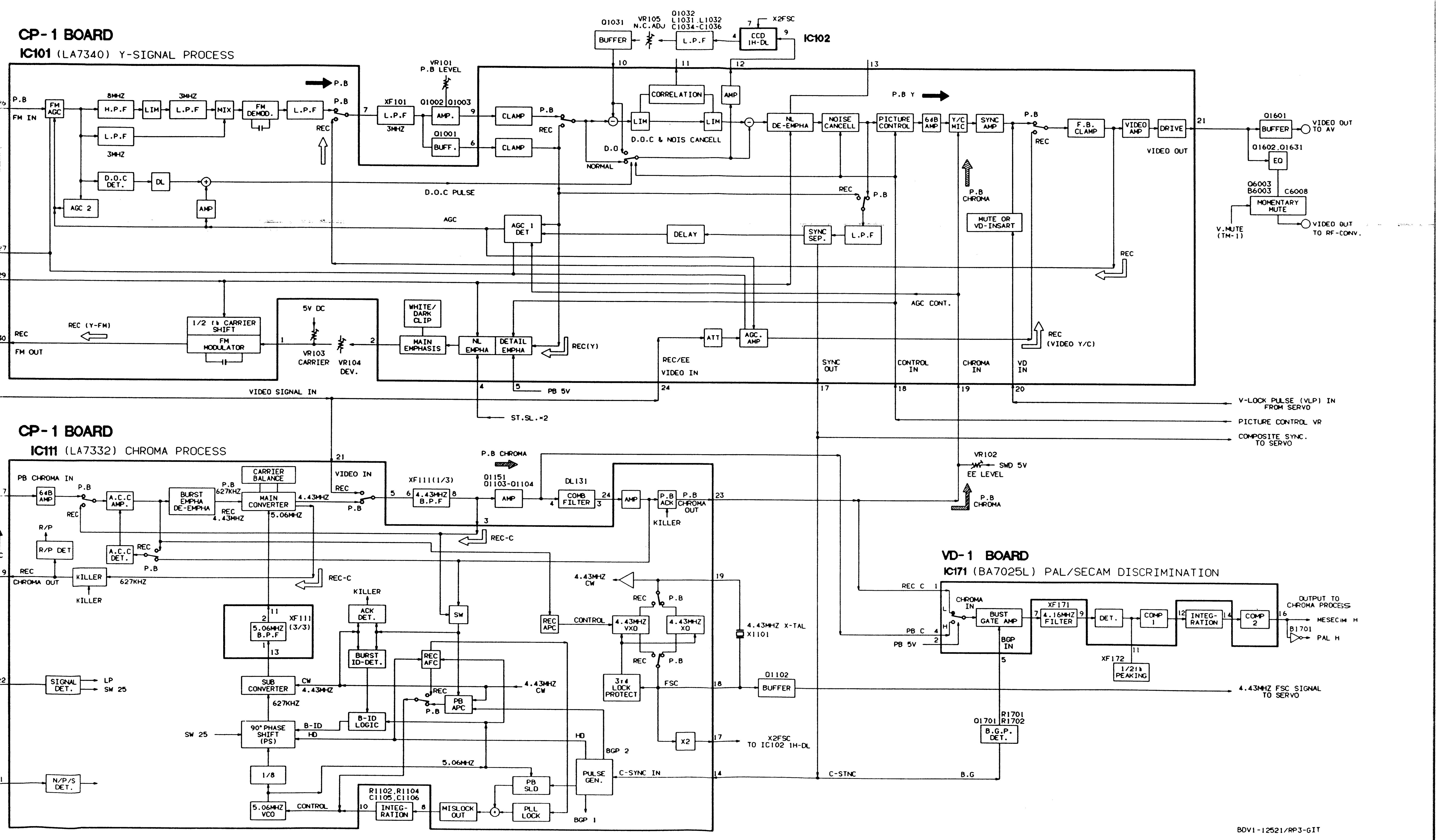
1-2. MECHANISM CONNECTION CIRCUIT DIAGRAM


MC-4
BOARD
T.S
D8301
CN831 CN801
T.S.LED(A)
T.S.LED(K)
EP(SF)
S8001
T.REEL D8001
R8001
270 1/6W
R8002
100 1/6W
S.REEL D8002
R8003
270 1/6W
MC-1 BOARD
CN802
G N D
SAFETY SW
S.REEL.P
SWD 5V
T.REEL.P
TO CP-1(SY-A)
CN302
CASSETTE
MECHANISM
T.TOP.S.
G N D
T.END.S.
G N D
FL.START.SW
G N D
TO CP-1(SY-A)
CN303
CAPSTAN MOTOR
MC
F/R
CAP VS
CAP FG2
GND
CAP FG1
SWD 5V
ALWAYS 13V(MC)
GND(MC)
TO CP-1(SY-A)
CN352
HEAD DRUM MOTOR
MH
DRUM PG
G N D
DRUM FG
ALWAYS 13V(MH)
DRUM VS
GND(MH)
TO CP-1(SY-A)
CN351
MC-3
BOARD
MECHANISM
MODE DETECT
SW
LOADING MOTOR
M.L
DEW
SENSOR
CN821
DEW SENSOR
G N D
CN822
G N D
SW DATA 2
SW DATA 1
SW DATA 3
ML(+)
ML(-)
DEW SENSOR
TO CP-1(SY-A)
CN301
CDM1-12511/RP3-EX

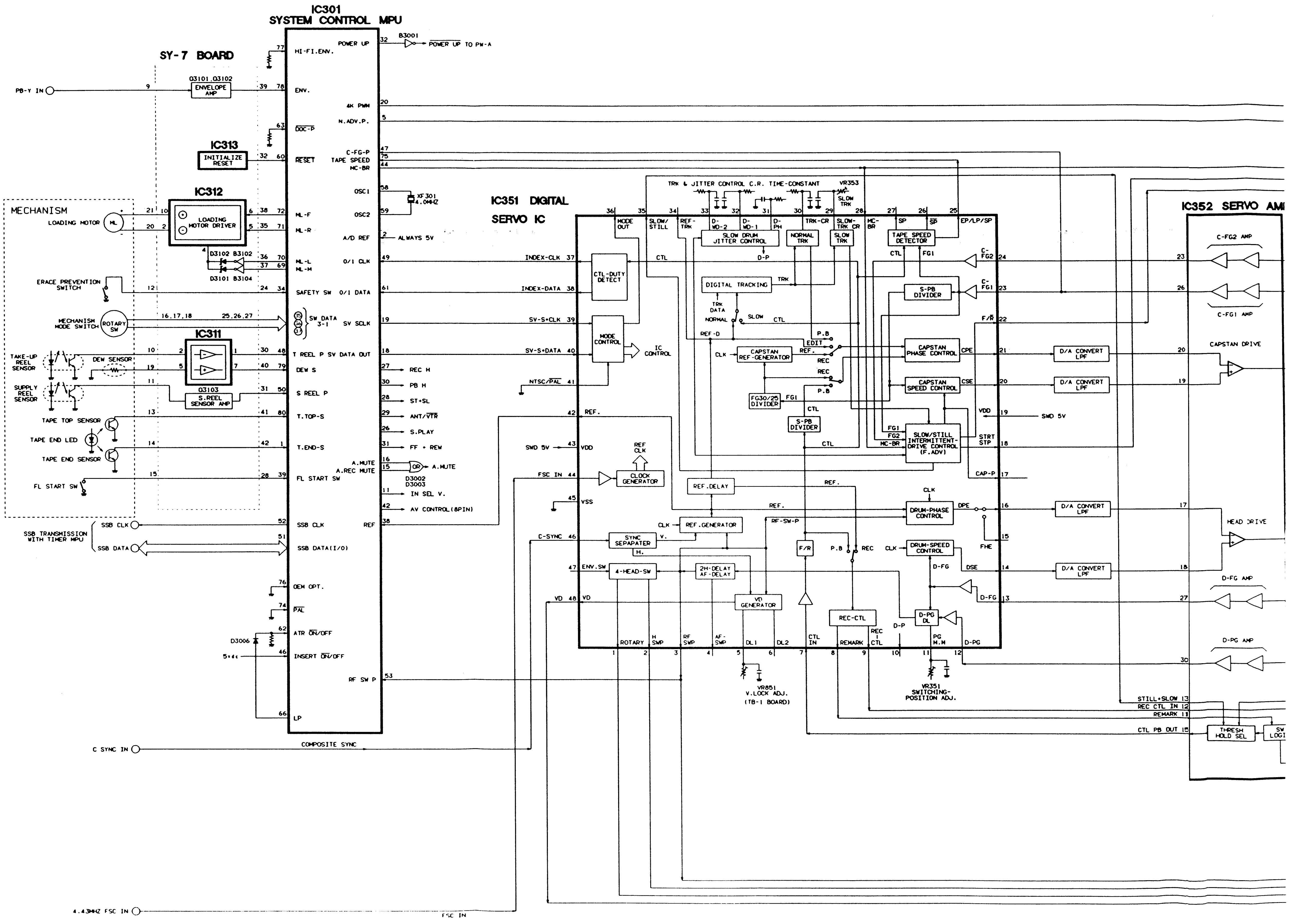
1-3. VIDEO CIRCUIT BASIC BLOCK DIAGRAM


VP-1
IC181 (LA7321) REC/PRE.AMP
HEAD DRUM
CH1
V-HEAD
CH2
R.T
SUB CH2
V-HEAD
AMP
SW
REC ON
RF SW P
COMP.
REC/SP ON
H.AMP.SW
ENV.OUT
PB
REC
CURRENT AMP
Y/C MIX AMP
PB ON
RF SW PULSE
TP183
RF SWITCHING PULSE
HEAD AMP SWITCH
RF SW P
H.AMP.SW
CURRENT CHECK
TP181
R1801
ENV.CHECK
TP182
RF.
7 ENVELOPE OUT
PB 5V
REC 12V
VR182
REC Y
FILTER
VR181
REC C
TB-1 BOARD
IC861 (BA7021) INPUT SELECT
AV VIDEO IN
TUNER VIDEO IN
MUTE
INPUT VIDEO SIG.
PB 5V
EXT H
CP-1 BOARD
IC101 (LA7340) Y-SIGNAL PROCESS
PB Y-FM
P.B
FM IN
FM AGC
8MHZ
H.P.F
LIM
3MHZ
L.P.F
MIX
FM DEMOD.
D.O.C DET.
DL
AGC 2
AMP
Q1501 Q1502
ASO CIRCUIT
Q1052-Q1054
EQ AMP
PB H
B1001
C1024
C1025
ST.SL.×2
RF SW P.
XF101
Q1002 Q1003
Q1001
BUFF.
CLAMP
VR101
P.B LEVEL
D.O.C PULSE
AGC
AGC 1 DET
DELAY
1/2 fH CARRIER SHIFT
FM MODULATOR
REC (Y-FM)
FM OUT
5V DC
VR103 CARRIER
VR104 DEV.
WHITE/ DARK CLIP
MAIN EMPHASIS
NL EMPHA
DETAIL EMPHA
REC(Y)
PB 5V
ST.SL.×2
ATT
AGC. AMP
REC/EE
VIDEO IN
VIDEO SIGNAL IN
Q1031
BUFFER
VR105
N.C.ADJ
Q1032
L1031.L1032
C1034-C1036
CCD 1H-DL
X2FSC
CORRELATION
D.O.C & NOIS CANCELL
D.O
NORMAL
CP-1 BOARD
IC111 (LA7332) CHROMA PROCESS
L1104.L1105
C1124.C1125
C1281
PB 5V
BUFFER
Q1005.Q1006
PB C
B1201
SYSTEM SW
C1201
PAL H
Q1101
XF111(2/3)
1.4MHZ L.P.F
REC C
PB CHROMA IN
64B AMP
A.C.C AMP.
A.C.C DET.
R/P
R/P DET
KILLER
CHROMA OUT
627KHZ
BURST EMPHA DE-EMPHA
CARRIER BALANCE
MAIN CONVERTER
4.43MHZ
5.06MHZ
VIDEO IN
XF111(1/3)
4.43MHZ B.P.F
Q1151
Q1103-Q1104
P.B CHROMA
DL131
COMB FILTER
P.B ACK
P.B CHROMA OUT
KILLER
REC-C
XF111 (3/3)
5.06MHZ B.P.F
ACK DET.
BURST ID-DET.
REC AFC
SW
PB APC
B-ID LOGIC
SUB CONVERTER
CW
90° PHASE SHIFT (PS)
B-ID
HD
1/8
5.06MHZ VCO
CONTROL
R1102.R1104
C1105.C1106
INTEG-RATION
MISLOCK OUT
PLL LOCK
PB SLD
PULSE GEN.
BGP 1
BGP 2
C-SYNC IN
REC APC
4.43MHZ VXO
4.43MHZ XO
3rd LOCK PROTECT
FSC
X2
TO IC102
4.43MHZ X
X1101
Q1102
SIGNAL DET.
LP
SW 25
N/P/S DET.
MESECAM H
RF SW P
SW 25

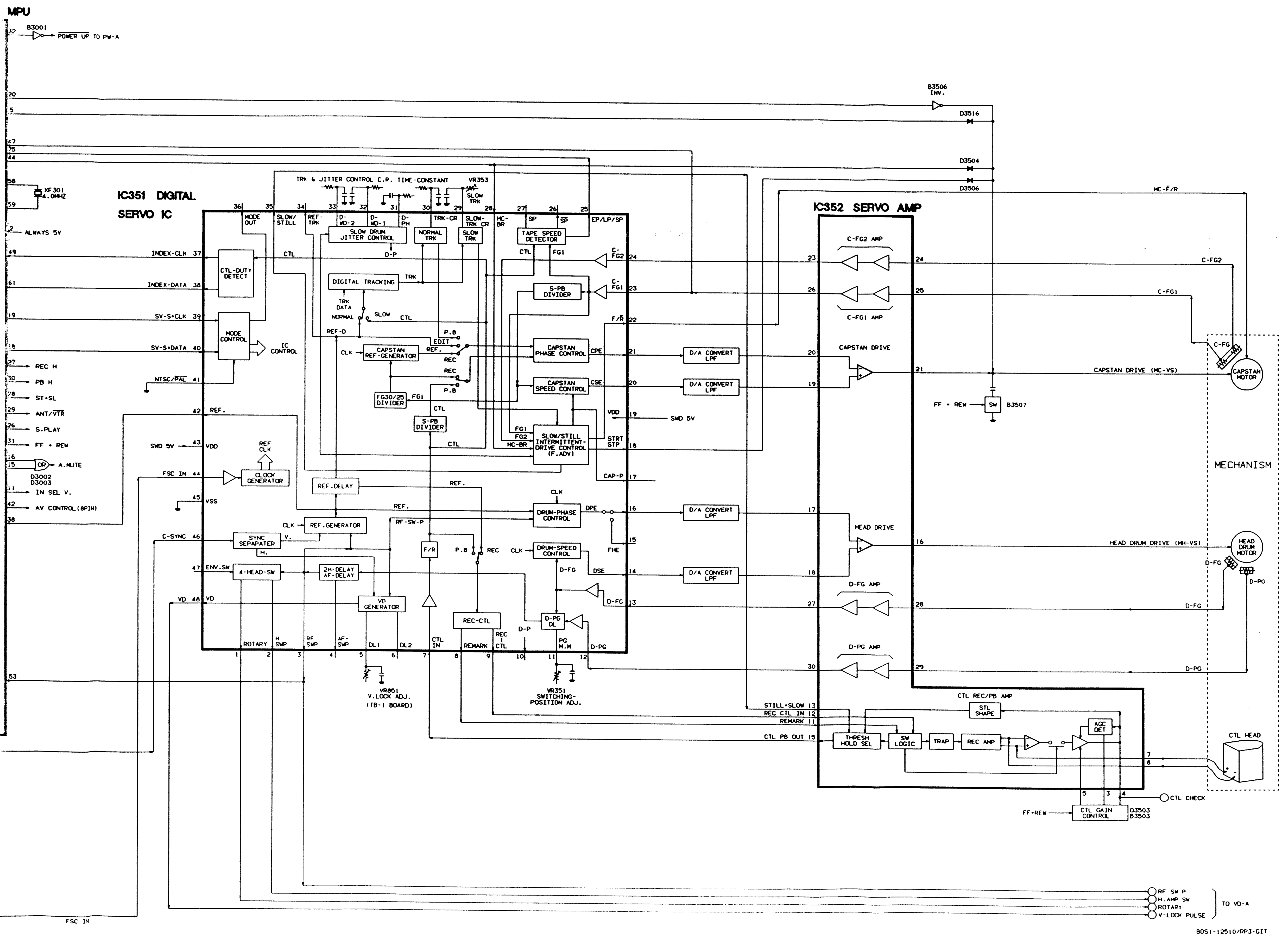
1-3. VIDEO CIRCUIT BASIC BLOCK DIAGRAM


CP-1 BOARD
IC101 (LA7340) Y-SIGNAL PROCESS
P.B
FM IN
FM AGC
8MHZ
H.P.F
LIM
3MHZ
L.P.F
MIX
FM DEMOD.
L.P.F
L.P.F
3MHZ
D.O.C DET.
DL
AGC 2
AMP
P.B
REC
VR101 P.B LEVEL
XF101
L.P.F
3MHZ
Q1002 Q1003
AMP.
Q1001
BUFF.
CLAMP
CLAMP
Q1031
BUFFER
VR105 N.C.ADJ
Q1032 L1031,L1032 C1034-C1036
L.P.F
X2FSC
CCD 1H-DL
IC102
CORRELATION
AMP
LIM
LIM
D.O.C & NOIS CANCELL
D.O
NORMAL
D.O.C PULSE
AGC
AGC 1 DET
DELAY
P.B Y
NL DE-EMPHA
NOISE CANCELL
PICTURE CONTROL
6dB AMP
Y/C MIC
SYNC AMP
P.B CHROMA
SYNC SEP.
L.P.F
MUTE OR VD-INSART
F.B. CLAMP
VIDEO AMP
DRIVE
VIDEO OUT
Q1601
BUFFER
VIDEO OUT TO AV
Q1602,Q1631
EQ
Q6003 B6003
C6008
MOMENTARY MUTE
V.MUTE (TM-1)
VIDEO OUT TO RF-CONV.
REC
AGC CONT.
REC (Y-FM)
1/2 fh CARRIER SHIFT
FM MODULATOR
FM OUT
5V DC
VR103 CARRIER
VR104 DEV.
WHITE/ DARK CLIP
MAIN EMPHASIS
NL EMPHA
DETAIL EMPHA
REC(Y)
ATT
AGC. AMP
REC (VIDEO Y/C)
REC/EE VIDEO IN
SYNC OUT
CONTROL IN
CHROMA IN
VD IN
PB 5V
ST.SL.×2
VIDEO SIGNAL IN
V-LOCK PULSE (VLP) IN FROM SERVO
PICTURE CONTROL VR
COMPOSITE SYNC. TO SERVO
CP-1 BOARD
IC111 (LA7332) CHROMA PROCESS
PB CHROMA IN
6dB AMP
A.C.C AMP.
BURST EMPHA DE-EMPHA
CARRIER BALANCE
MAIN CONVERTER
627KHZ
4.43MHZ
5.06MHZ
VIDEO IN
XF111(1/3)
4.43MHZ B.P.F
Q1151 Q1103-Q1104
AMP
DL131
COMB FILTER
AMP
P.B ACK
P.B CHROMA OUT
KILLER
REC-C
VR102
SWD 5V
EE LEVEL
R/P
R/P DET
A.C.C DET.
CHROMA OUT
KILLER
627KHZ
KILLER
ACK DET.
SW
XF111 (3/3)
5.06MHZ B.P.F
BURST ID-DET.
REC AFC
REC APC
CONTROL
4.43MHZ VXO
4.43MHZ XO
4.43MHZ CW
3:4 LOCK PROTECT
FSC
4.43MHZ X-TAL X1101
Q1102
BUFFER
4.43MHZ FSC SIGNAL TO SERVO
SIGNAL DET.
LP
SW 25
SUB CONVERTER
CW
4.43MHZ CW
PB APC
B-ID LOGIC
SW 25
90° PHASE SHIFT (PS)
B-ID
HD
1/8
5.06MHZ
5.06MHZ VCO
R1102,R1104 C1105,C1106
INTEG-RATION
MISLOCK OUT
PLL LOCK
PB SLD
PULSE GEN.
BGP 2
BGP 1
C-SYNC IN
X2
X2FSC TO IC102 1H-DL
C-STNC
N/P/S DET.
VD-1 BOARD
IC171 (BA7025L) PAL/SECAM DISCRIMINATION
REC C
PB C
PB 5V
CHROMA IN
BUST GATE AMP
BGP IN
XF171
4.16MHZ FILTER
DET.
COMP 1
INTEG-RATION
COMP 2
1/2fh PEAKING
XF172
OUTPUT TO CHROMA PROCESS
MESECM H
PAL H
B1701
Q1701
R1701 R1702
B.G.P. DET.
B.G
BOV1-12521/RP3-GIT

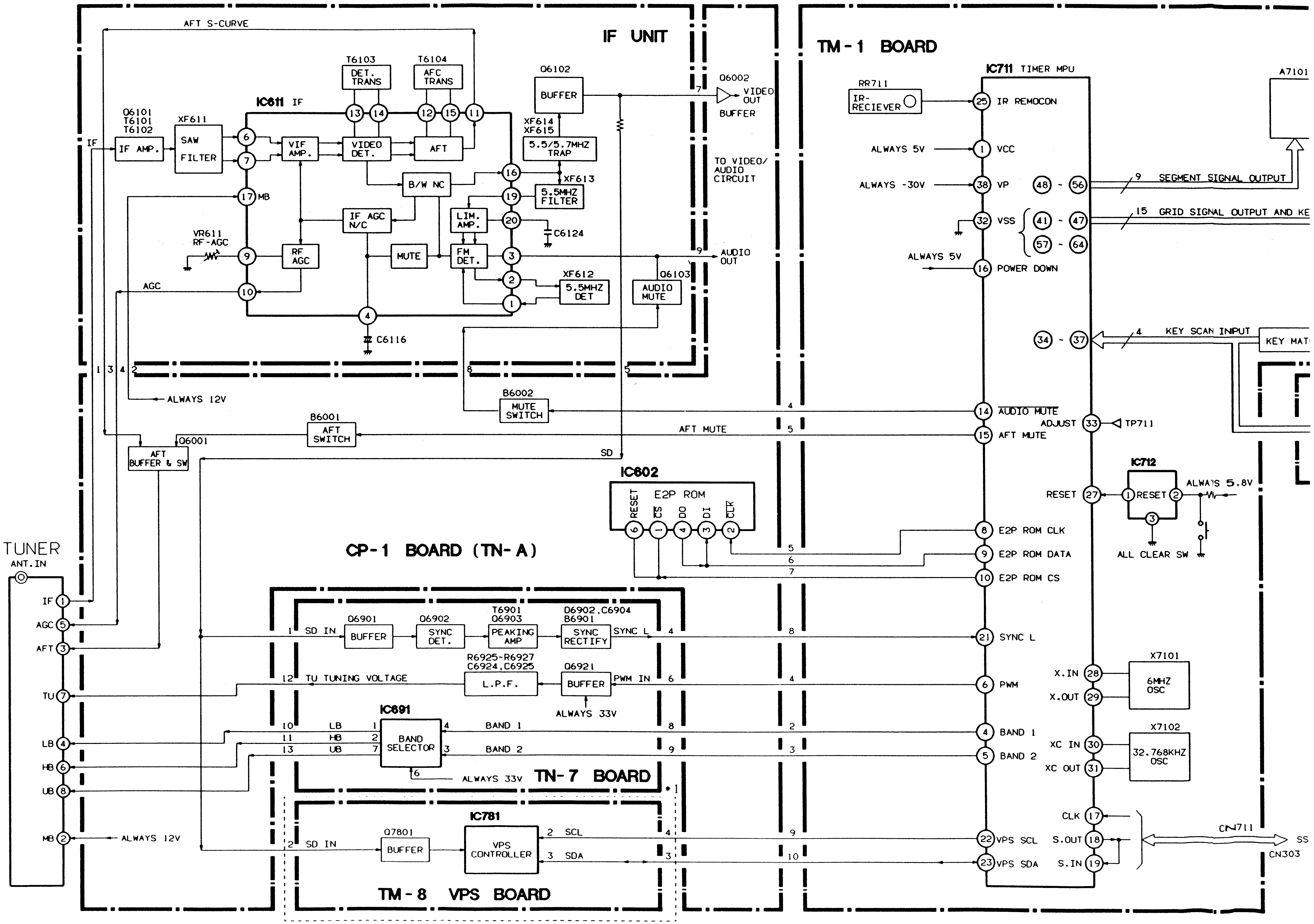
1-4. SYSTEM CONTROL & SERVO CIRCUIT BASIC BLOCK DIAGRAM


IC301
SYSTEM CONTROL MPU
SY-7 BOARD
PB-Y IN
Q3101, Q3102
ENVELOPE AMP
IC313
INITIALIZE RESET
IC312
LOADING MOTOR DRIVER
D3102 B3102
D3101 B3104
MECHANISM
LOADING MOTOR
ML
ERACE PREVENTION SWITCH
MECHANISM MODE SWITCH
ROTARY SW
IC311
TAKE-UP REEL SENSOR
DEW SENSOR
SUPPLY REEL SENSOR
Q3103
S.REEL SENSOR AMP
TAPE TOP SENSOR
TAPE END LED
TAPE END SENSOR
FL START SW
SSB TRANSMISSION WITH TIMER MPU
SSB CLK
SSB DATA
HI-FI.ENV.
ENV.
DOC-P
RESET
ML-F
ML-R
ML-L
ML-M
SAFETY SW
SW DATA 3-1
T REEL P
DEW S
S REEL P
T.TOP-S
T.END-S
FL START SW
SSB CLK
SSB DATA(I/O)
OEM OPT.
PAL
ATR ON/OFF
INSERT ON/OFF
LP
D3006
5V
POWER UP
4K PWM
N.ADV.P.
C-FG-P
TAPE SPEED
MC-BR
OSC1
OSC2
A/D REF
0/1 CLK
0/1 DATA
SV SCLK
SV DATA OUT
A.MUTE
A.REC MUTE
REF
RF SW P
B3001
POWER UP TO PW-A
XF301 4.0MHZ
ALWAYS 5V
REC H
PB H
ST+SL
ANT/VTR
S.PLAY
FF + REW
A.MUTE
D3002 D3003
IN SEL V.
AV CONTROL(8PIN)
C SYNC IN
COMPOSITE SYNC
4.43MHZ FSC IN
FSC IN
IC351 DIGITAL SERVO IC
TRK & JITTER CONTROL C.R. TIME-CONSTANT
VR353
SLOW TRK
MODE OUT
SLOW/STILL
REF-TRK
D-WD-2
D-WD-1
D-PH
TRK-CR
SLOW-TRK CR
MC-BR
SP
SP
EP/LP/SP
SLOW DRUM JITTER CONTROL
NORMAL TRK
SLOW TRK
TAPE SPEED DETECTOR
INDEX-CLK
INDEX-DATA
SV-S•CLK
SV-S•DATA
NTSC/PAL
REF.
SWD 5V
VDD
FSC IN
VSS
C-SYNC
ENV.SW
VD
CTL-DUTY DETECT
MODE CONTROL
IC CONTROL
DIGITAL TRACKING
TRK DATA
NORMAL
SLOW
REF-D
CLK
CAPSTAN REF-GENERATOR
FG30/25 DIVIDER
S-PB DIVIDER
S-PB DIVIDER
CAPSTAN PHASE CONTROL
CAPSTAN SPEED CONTROL
SLOW/STILL INTERMITTENT-DRIVE CONTROL (F.ADV)
FG1
FG2
MC-BR
CTL
P.B
EDIT
REC
REF CLK
CLOCK GENERATOR
REF.DELAY
REF.GENERATOR
SYNC SEPAPATER
4-HEAD-SW
2H-DELAY AF-DELAY
VD GENERATOR
F/R
REF-SW-P
DRUM-PHASE CONTROL
DRUM-SPEED CONTROL
REC-CTL
D-PG DL
D-FG
D-P
C-FG2
C-FG1
F/R
CPE
CSE
VDD
STRT STP
CAP-P
DPE
FHE
DSE
D-FG
ROTARY
H SWP
RF SWP
AF-SWP
DL1
DL2
CTL IN
REMARK
REC I CTL
PG M.M
D-PG
VR851 V.LOCK ADJ. (TB-1 BOARD)
VR351 SWITCHING-POSITION ADJ.
SWD 5V
D/A CONVERT LPF
D/A CONVERT LPF
D/A CONVERT LPF
D/A CONVERT LPF
IC352 SERVO AM
C-FG2 AMP
C-FG1 AMP
CAPSTAN DRIVE
HEAD DRIVE
D-FG AMP
D-PG AMP
STILL•SLOW
REC CTL IN
REMARK
CTL PB OUT
THRESH HOLD SEL
SW LOGI
FSC IN
K
J
I
H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

1-4. SYSTEM CONTROL & SERVO CIRCUIT BASIC BLOCK DIAGRAM

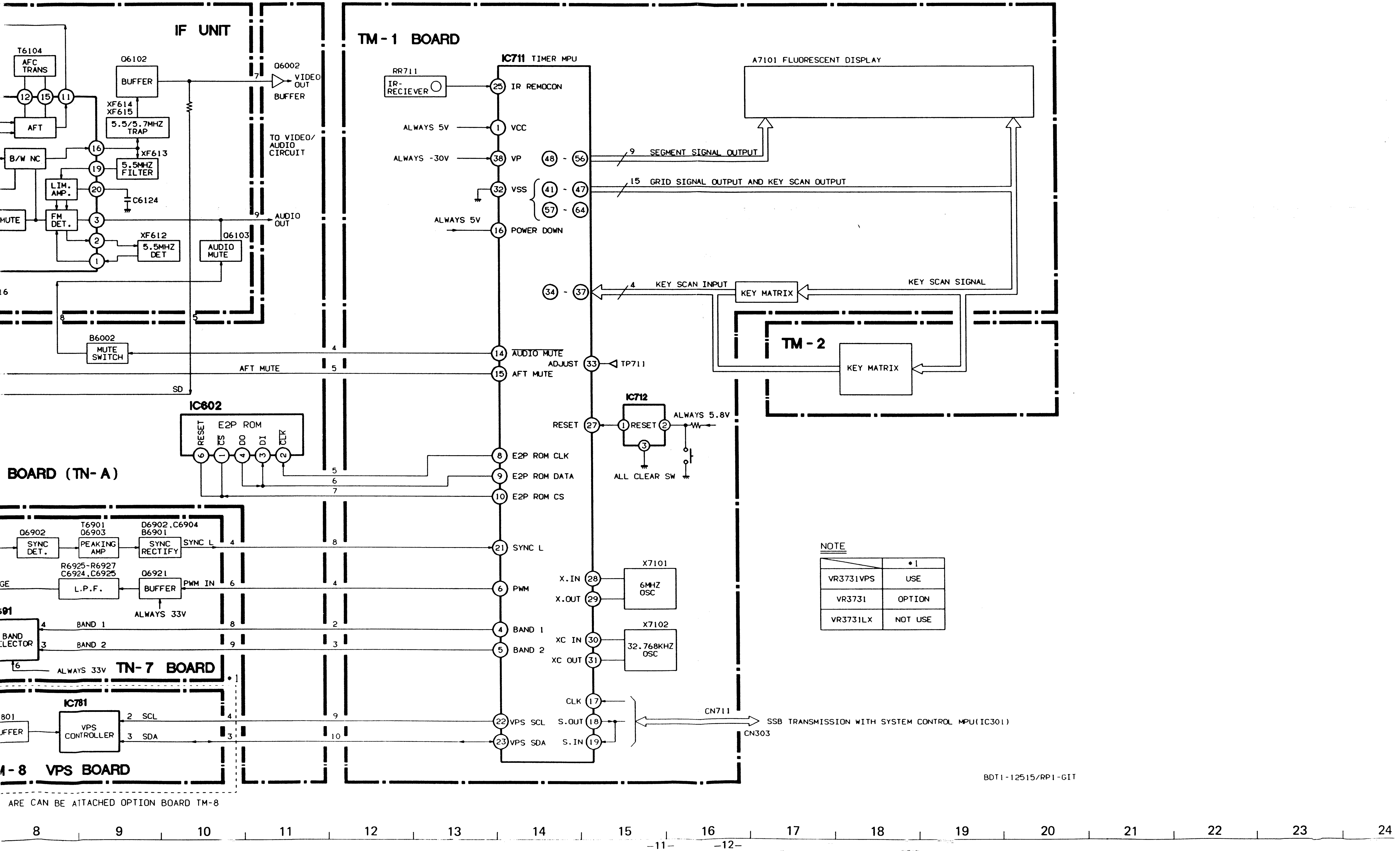

MPU
B3001
POWER UP TO PW-A
ALWAYS 5V
XF301 4.0MHZ
REC H
PB H
ST+SL
ANT/VTR
S.PLAY
FF + REW
A.MUTE
D3002 D3003
IN SEL V.
AV CONTROL(8PIN)
IC351 DIGITAL SERVO IC
INDEX-CLK 37
INDEX-DATA 38
SV-S-CLK 39
SV-S-DATA 40
NTSC/PAL 41
42 REF.
SWD 5V 43 VDD
FSC IN 44
45 VSS
C-SYNC 46
47 ENV.SW
VD 48 VD
CTL-DUTY DETECT
MODE CONTROL
IC CONTROL
REF CLK
CLOCK GENERATOR
REF.DELAY
REF.GENERATOR
SYNC SEPAPATER
4-HEAD-SW
2H-DELAY AF-DELAY
VD GENERATOR
TRK & JITTER CONTROL C.R. TIME-CONSTANT
VR353 SLOW TRK
MODE OUT
SLOW/STILL
REF-TRK
D-WD-2
D-WD-1
D-PH
TRK-CR
SLOW-TRK CR
MC-BR
SP
EP/LP/SP
SLOW DRUM JITTER CONTROL
NORMAL TRK
SLOW TRK
TAPE SPEED DETECTOR
DIGITAL TRACKING
TRK DATA
NORMAL
SLOW
REF-D
EDIT
CAPSTAN REF-GENERATOR
FG30/25 DIVIDER
S-PB DIVIDER
CAPSTAN PHASE CONTROL
CAPSTAN SPEED CONTROL
SLOW/STILL INTERMITTENT-DRIVE CONTROL (F.ADV)
C-FG2 24
C-FG1 23
F/R 22
CPE 21
CSE 20
VDD 19
SWD 5V
STRT STP 18
CAP-P 17
DRUM-PHASE CONTROL
DPE 16
FHE 15
DRUM-SPEED CONTROL
DSE 14
D-FG 13
D-PG DL
D-PG
F/R
P.B
REC
REC-CTL
CTL IN
REMARK
REC CTL
PG H.M
ROTARY
H SWP
RF SWP
AF-SWP
DL1
DL2
VR851 V.LOCK ADJ. (TB-1 BOARD)
VR351 SWITCHING-POSITION ADJ.
D/A CONVERT LPF
B3506 INV.
D3516
D3504
D3506
MC-F/R
IC352 SERVO AMP
C-FG2 AMP
C-FG1 AMP
CAPSTAN DRIVE
HEAD DRIVE
D-FG AMP
D-PG AMP
CAPSTAN DRIVE (MC-VS)
HEAD DRUM DRIVE (MH-VS)
C-FG2
C-FG1
C-FG
CAPSTAN MOTOR
HEAD DRUM MOTOR
D-FG
D-PG
FF + REW
SW
B3507
MECHANISM
CTL REC/PB AMP
STL SHAPE
STILL+SLOW 13
REC CTL IN 12
REMARK 11
CTL PB OUT 15
THRESH HOLD SEL
SW LOGIC
TRAP
REC AMP
AGC DET
CTL HEAD
CTL CHECK
FF+REW
CTL GAIN CONTROL
Q3503 B3503
RF SW P
H.AMP SW
ROTARY
V-LOCK PULSE
TO VD-A
FSC IN
8DS1-12510/RP3-GIT

1-5. TUNING & TIMER CIRCUIT BASIC BLOCK DIAGRAM


IF UNIT
AFT S-CURVE
T6103
DET. TRANS
T6104
AFC TRANS
IC611 IF
Q6101
T6101
T6102
IF AMP.
XF611
SAW FILTER
VIF AMP.
VIDEO DET.
AFT
B/W NC
IF AGC N/C
MUTE
LIM. AMP.
FM DET.
RF AGC
MB
VR611
RF-AGC
AGC
C6116
C6124
Q6102
BUFFER
XF614
XF615
5.5/5.7MHZ TRAP
XF613
5.5MHZ FILTER
XF612
5.5MHZ DET
Q6103
AUDIO MUTE
Q6002
VIDEO OUT
BUFFER
TO VIDEO/ AUDIO CIRCUIT
AUDIO OUT
ALWAYS 12V
B6002
MUTE SWITCH
B6001
AFT SWITCH
Q6001
AFT BUFFER & SW
AFT MUTE
SD
TUNER
ANT.IN
IF
AGC
AFT
TU
LB
HB
UB
MB
ALWAYS 12V
CP-1 BOARD (TN-A)
IC602
E2P ROM
RESET
CS
DO
DI
CLK
SD IN
Q6901
BUFFER
Q6902
SYNC DET.
T6901
Q6903
PEAKING AMP
Q6902,C6904
B6901
SYNC RECTIFY
SYNC L
TU TUNING VOLTAGE
R6925-R6927
C6924,C6925
L.P.F.
Q6921
BUFFER
PWM IN
ALWAYS 33V
IC691
BAND SELECTOR
LB
HB
UB
BAND 1
BAND 2
ALWAYS 33V
TN-7 BOARD
*1
IC781
Q7801
BUFFER
VPS CONTROLLER
SD IN
SCL
SDA
TM-8 VPS BOARD
TM-1 BOARD
IC711 TIMER MPU
RR711
IR-RECIEVER
IR REMOCON
ALWAYS 5V
VCC
ALWAYS -30V
VP
VSS
ALWAYS 5V
POWER DOWN
SEGMENT SIGNAL OUTPUT
GRID SIGNAL OUTPUT AND KE
A7101
KEY SCAN INPUT
KEY MAT
AUDIO MUTE
ADJUST
TP711
AFT MUTE
IC712
RESET
RESET
ALWAYS 5.8V
ALL CLEAR SW
E2P ROM CLK
E2P ROM DATA
E2P ROM CS
SYNC L
PWM
BAND 1
BAND 2
X.IN
X.OUT
X7101
6MHZ OSC
XC IN
XC OUT
X7102
32.768KHZ OSC
CLK
S.OUT
S.IN
VPS SCL
VPS SDA
CN711
CN303
SS

MODELS VR3731 ARE CAN BE ATTACHED OPTION BOARD TM-8

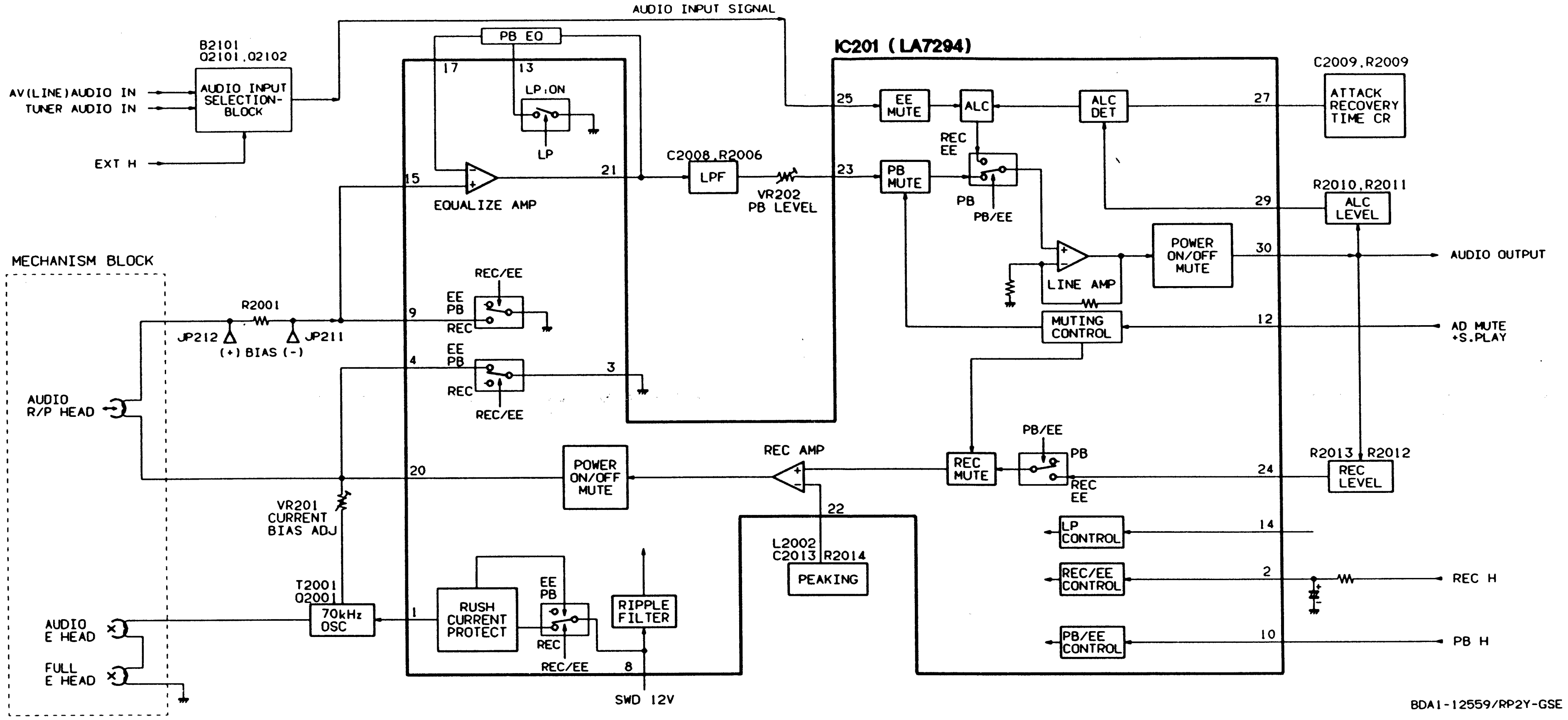
1-5. TUNING & TIMER CIRCUIT BASIC BLOCK DIAGRAM


IF UNIT
T6104
AFC TRANS
Q6102
BUFFER
Q6002
VIDEO OUT
BUFFER
XF614
XF615
5.5/5.7MHZ TRAP
XF613
5.5MHZ FILTER
AFT
B/W NC
LIM. AMP.
C6124
MUTE
FM DET.
XF612
5.5MHZ DET
Q6103
AUDIO MUTE
TO VIDEO/ AUDIO CIRCUIT
AUDIO OUT
B6002
MUTE SWITCH
AFT MUTE
SD
IC602
E2P ROM
RESET
CS
DO
DI
CLK
BOARD (TN-A)
Q6902
SYNC DET.
T6901
Q6903
PEAKING AMP
D6902, C6904
B6901
SYNC RECTIFY
SYNC L
R6925-R6927
C6924, C6925
L.P.F.
Q6921
BUFFER
PWM IN
ALWAYS 33V
BAND ELECTOR
BAND 1
BAND 2
ALWAYS 33V
TN-7 BOARD
IC781
VPS CONTROLLER
SCL
SDA
M-8 VPS BOARD
ARE CAN BE ATTACHED OPTION BOARD TM-8
TM-1 BOARD
RR711
IR-RECIEVER
IC711 TIMER MPU
IR REMOCON
ALWAYS 5V
VCC
ALWAYS -30V
VP
VSS
ALWAYS 5V
POWER DOWN
AUDIO MUTE
ADJUST
TP711
AFT MUTE
RESET
IC712
RESET
ALWAYS 5.8V
ALL CLEAR SW
E2P ROM CLK
E2P ROM DATA
E2P ROM CS
SYNC L
PWM
BAND 1
BAND 2
VPS SCL
VPS SDA
X.IN
X.OUT
X7101
6MHZ OSC
XC IN
XC OUT
X7102
32.768KHZ OSC
CLK
S.OUT
S.IN
CN711
SSB TRANSMISSION WITH SYSTEM CONTROL MPU(IC301)
CN303
A7101 FLUORESCENT DISPLAY
SEGMENT SIGNAL OUTPUT
GRID SIGNAL OUTPUT AND KEY SCAN OUTPUT
KEY SCAN INPUT
KEY MATRIX
KEY SCAN SIGNAL
TM-2
KEY MATRIX
BDT1-12515/RP1-GIT
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24

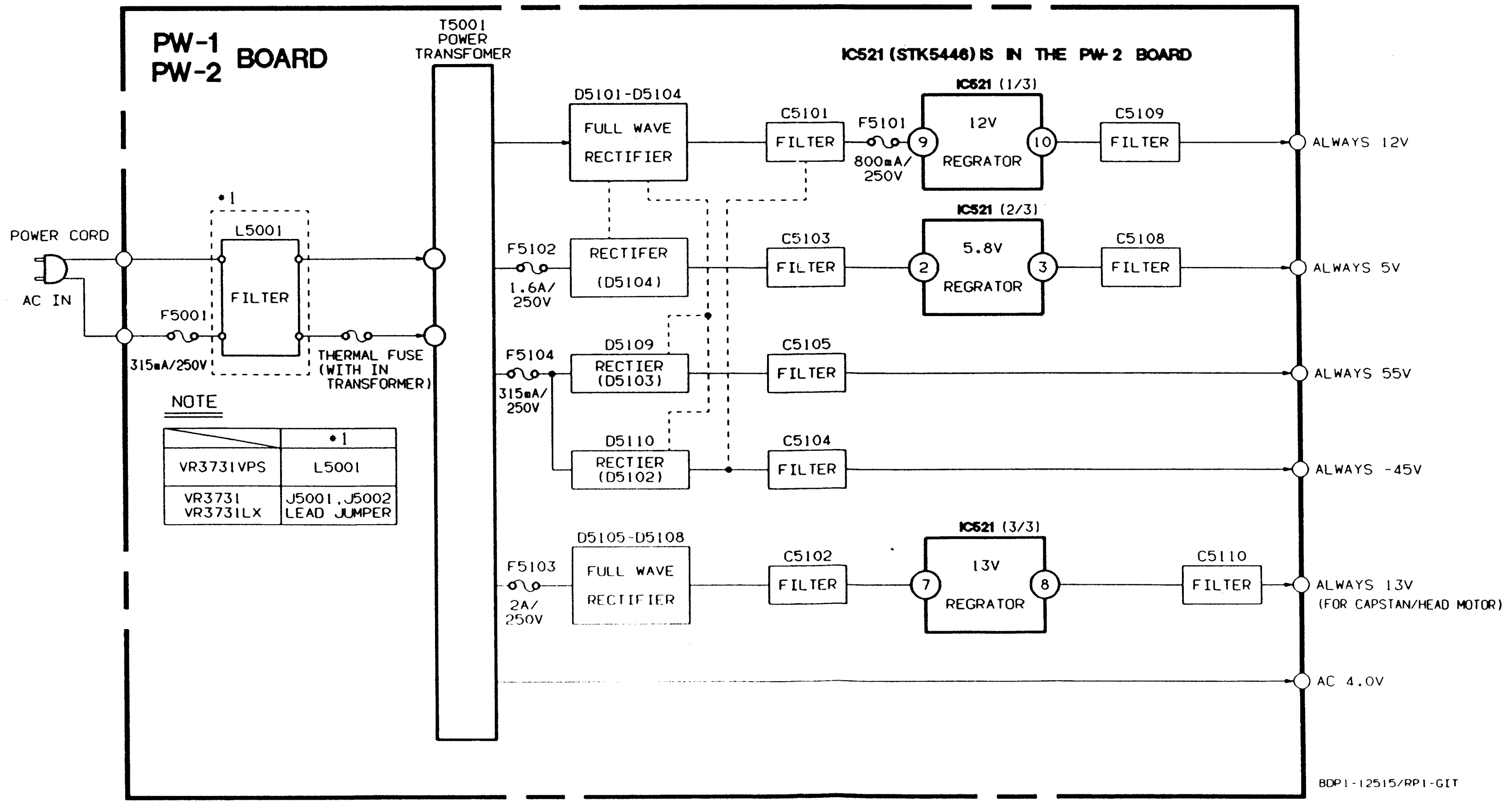
NOTE

	•1
VR3731VPS	USE
VR3731	OPTION
VR3731LX	NOT USE

1-6. AUDIO CIRCUIT BASIC BLOCK DIAGRAM


AUDIO INPUT SIGNAL
B2101
02101,02102
AUDIO INPUT SELECTION-BLOCK
AV(LINE)AUDIO IN
TUNER AUDIO IN
EXT H
PB EQ
17
13
LP:ON
LP
15
EQUALIZE AMP
21
C2008,R2006
LPF
VR202
PB LEVEL
IC201 (LA7294)
25
EE MUTE
ALC
ALC DET
27
C2009,R2009
ATTACK RECOVERY TIME CR
REC
EE
23
PB MUTE
PB
PB/EE
29
R2010,R2011
ALC LEVEL
POWER ON/OFF MUTE
30
AUDIO OUTPUT
LINE AMP
MUTING CONTROL
12
AD MUTE
+S.PLAY
MECHANISM BLOCK
R2001
JP212
JP211
(+) BIAS (-)
REC/EE
EE
PB
REC
9
4
3
AUDIO
R/P HEAD
20
POWER ON/OFF MUTE
REC AMP
REC MUTE
PB/EE
PB
REC
EE
24
R2013
R2012
REC LEVEL
VR201
CURRENT
BIAS ADJ
22
L2002
C2013
R2014
PEAKING
14
LP CONTROL
REC/EE CONTROL
2
REC H
T2001
02001
70kHz OSC
1
RUSH CURRENT PROTECT
RIPPLE FILTER
AUDIO
E HEAD
FULL
E HEAD
8
SWD 12V
10
PB/EE CONTROL
PB H
BDA1-12559/RP2Y-GSE

1-7. POWER SUPPLY CIRCUIT BASIC BLOCK DAIGRAM

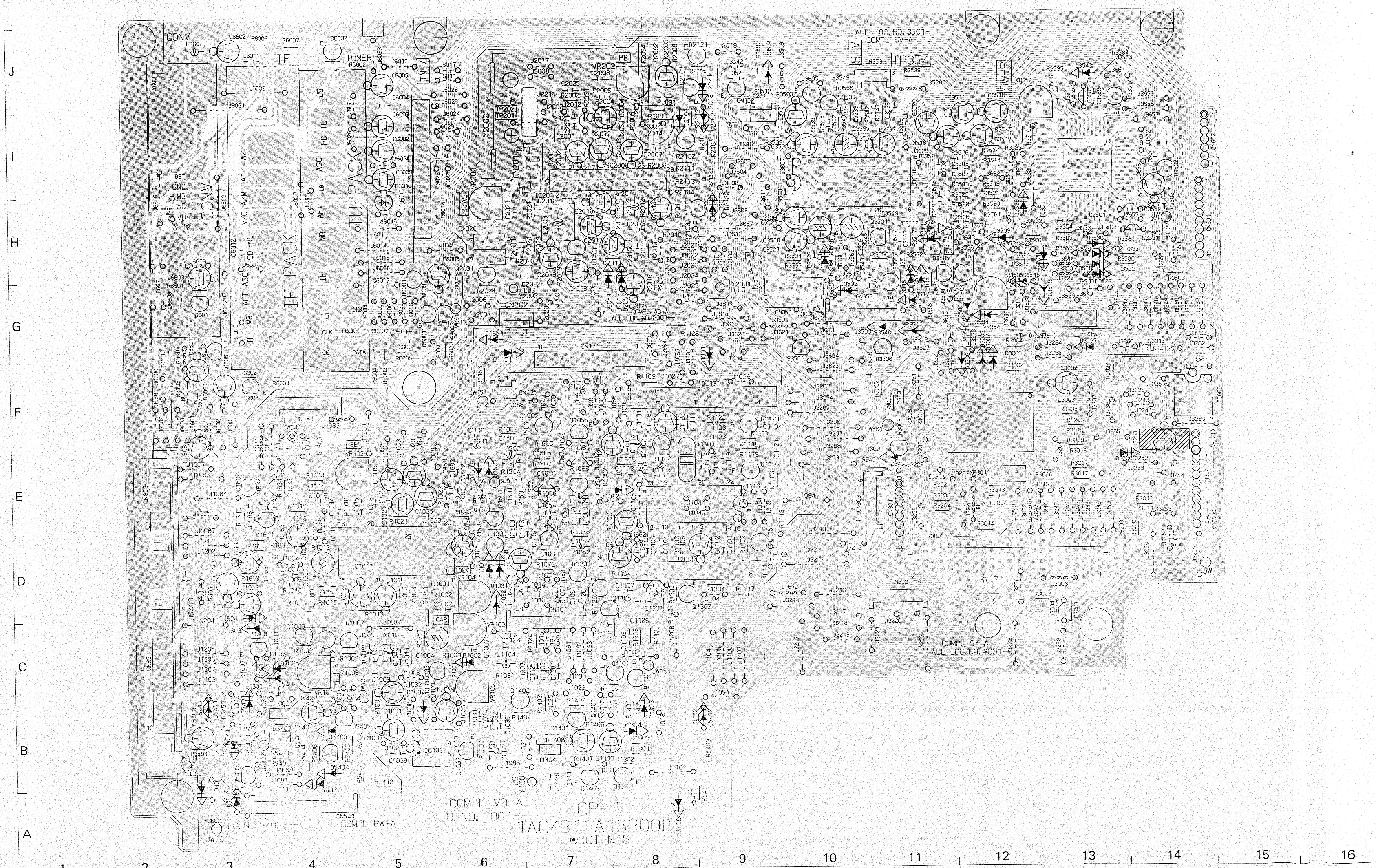

PW-1
PW-2
BOARD
T5001
POWER
TRANSFOMER
IC521 (STK5446) IS IN THE PW-2 BOARD
D5101-D5104
FULL WAVE RECTIFIER
C5101
FILTER
F5101
800mA/250V
IC521 (1/3)
12V REGRATOR
9
10
C5109
FILTER
ALWAYS 12V
POWER CORD
AC IN
*1
L5001
FILTER
F5001
315mA/250V
THERMAL FUSE (WITH IN TRANSFORMER)
F5102
1.6A/250V
RECTIFER (D5104)
C5103
FILTER
IC521 (2/3)
5.8V REGRATOR
2
3
C5108
FILTER
ALWAYS 5V
F5104
315mA/250V
D5109
RECTIER (D5103)
C5105
FILTER
ALWAYS 55V
D5110
RECTIER (D5102)
C5104
FILTER
ALWAYS -45V
D5105-D5108
F5103
2A/250V
FULL WAVE RECTIFIER
C5102
FILTER
IC521 (3/3)
13V REGRATOR
7
8
C5110
FILTER
ALWAYS 13V
(FOR CAPSTAN/HEAD MOTOR)
AC 4.0V
BDP1-12515/RP1-GIT

NOTE

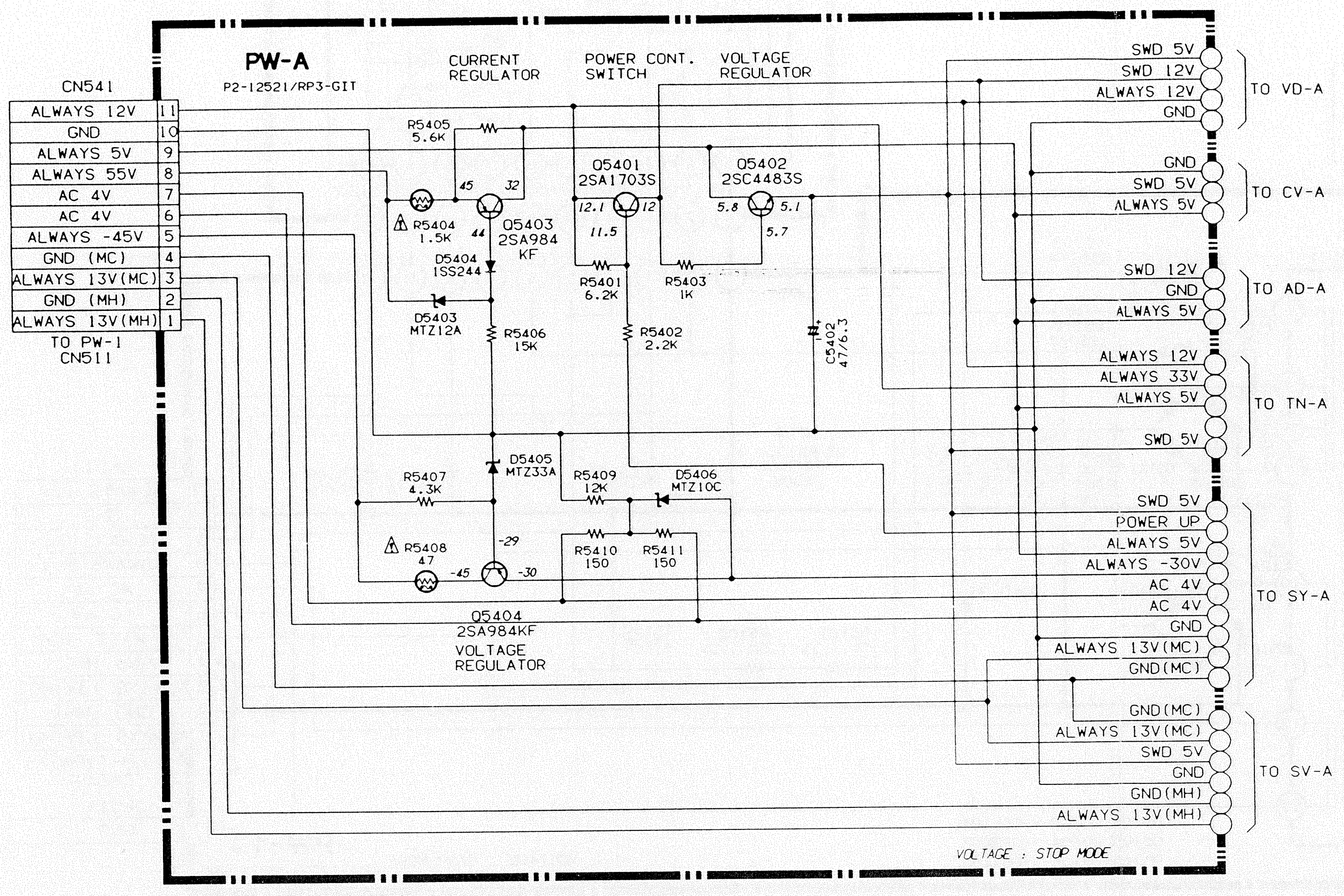
	*1
VR3731VPS	L5001
VR3731 VR3731LX	J5001,J5002 LEAD JUMPER

2. CIRCUIT DIAGRAM & CIRCUIT BOARD

2-1. CP-1 CIRCUIT BOARD


K
J
I
H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
CONV
IF
TUNER
TU-PACK
IF PACK
ALL LOC. NO. 3501-
COMPL SV-A
TP354
COMPL AD-A
ALL LOC. NO. 2001-
VD-1
SY-7
COMPL SY-A
ALL LOC. NO. 3001-
COMPL VD-A
LO. NO. 1001---
CP-1
1AC4B11A18900D
JCI-N15
LO. NO. 5400---
COMPL PW-A

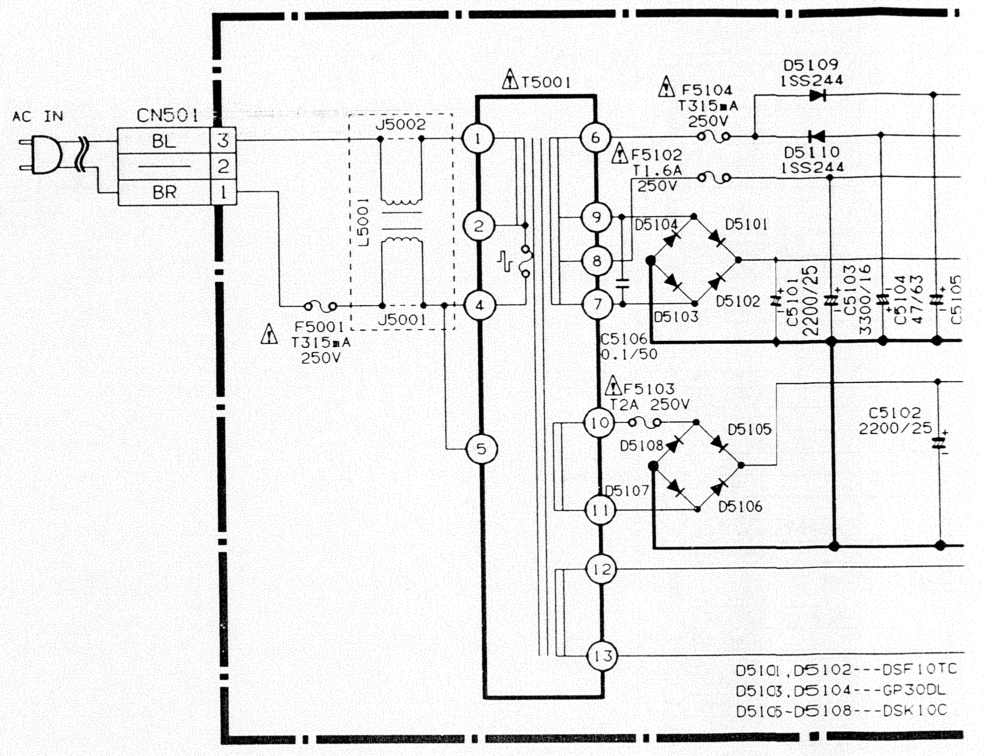
2-2. CP-1 BOARD (PW-A) POWER SUPPLY CIRCUIT DIGRAM


PW-A
P2-12521/RP3-GIT
CURRENT REGULATOR
POWER CONT. SWITCH
VOLTAGE REGULATOR
CN541
ALWAYS 12V 11
GND 10
ALWAYS 5V 9
ALWAYS 55V 8
AC 4V 7
AC 4V 6
ALWAYS -45V 5
GND (MC) 4
ALWAYS 13V(MC) 3
GND (MH) 2
ALWAYS 13V(MH) 1
TO PW-1 CN511
R5405 5.6K
R5404 1.5K
45
32
44
Q5403 2SA984 KF
D5404 1SS244
D5403 MTZ12A
R5406 15K
Q5401 2SA1703S
12.1
12
11.5
R5401 6.2K
R5402 2.2K
Q5402 2SC4483S
5.8
5.1
5.7
R5403 1K
C5402 47/6.3
D5405 MTZ33A
R5407 4.3K
R5408 47
-29
-45
-30
Q5404 2SA984KF
VOLTAGE REGULATOR
R5409 12K
D5406 MTZ10C
R5410 150
R5411 150
SWD 5V
SWD 12V
ALWAYS 12V
GND
TO VD-A
GND
SWD 5V
ALWAYS 5V
TO CV-A
SWD 12V
GND
ALWAYS 5V
TO AD-A
ALWAYS 12V
ALWAYS 33V
ALWAYS 5V
SWD 5V
TO TN-A
SWD 5V
POWER UP
ALWAYS 5V
ALWAYS -30V
AC 4V
AC 4V
GND
ALWAYS 13V(MC)
GND(MC)
TO SY-A
GND(MC)
ALWAYS 13V(MC)
SWD 5V
GND
GND(MH)
ALWAYS 13V(MH)
TO SV-A
VOLTAGE : STOP MODE

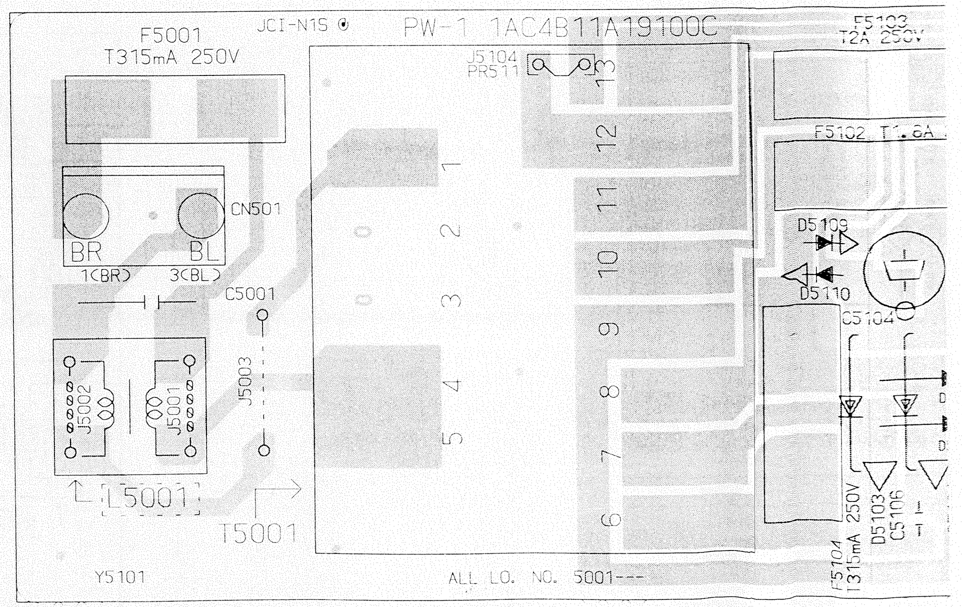
2-3. PW-1, 2 BOARD POWER S

NOTE

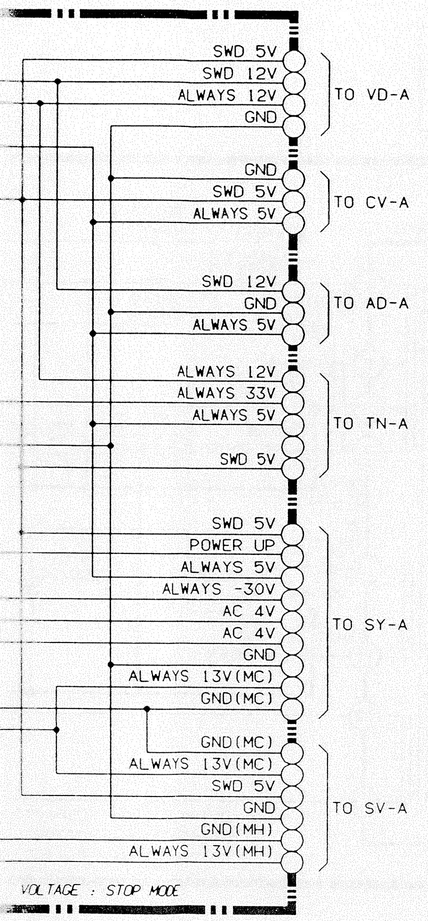
	L5001	J5001 J5002
VR3731VPS	USE	NOT USE
VR3731 VR3731LX	NOT USE	USE


AC IN
CN501
BL 3
2
BR 1
J5002
L5001
J5001
F5001 T315mA 250V
T5001
1
2
4
5
6
9
8
7
10
11
12
13
F5104 T315mA 250V
D5109 1SS244
D5110 1SS244
F5102 T1.6A 250V
D5104
D5101
D5103
D5102
C5101 2200/25
C5103 3300/16
C5104 47/63
C5105
C5106 0.1/50
F5103 T2A 250V
D5105
D5108
D5107
D5106
C5102 2200/25
D5101, D5102---DSF10TC
D5103, D5104---GP30DL
D5105-D5108---DSK10C

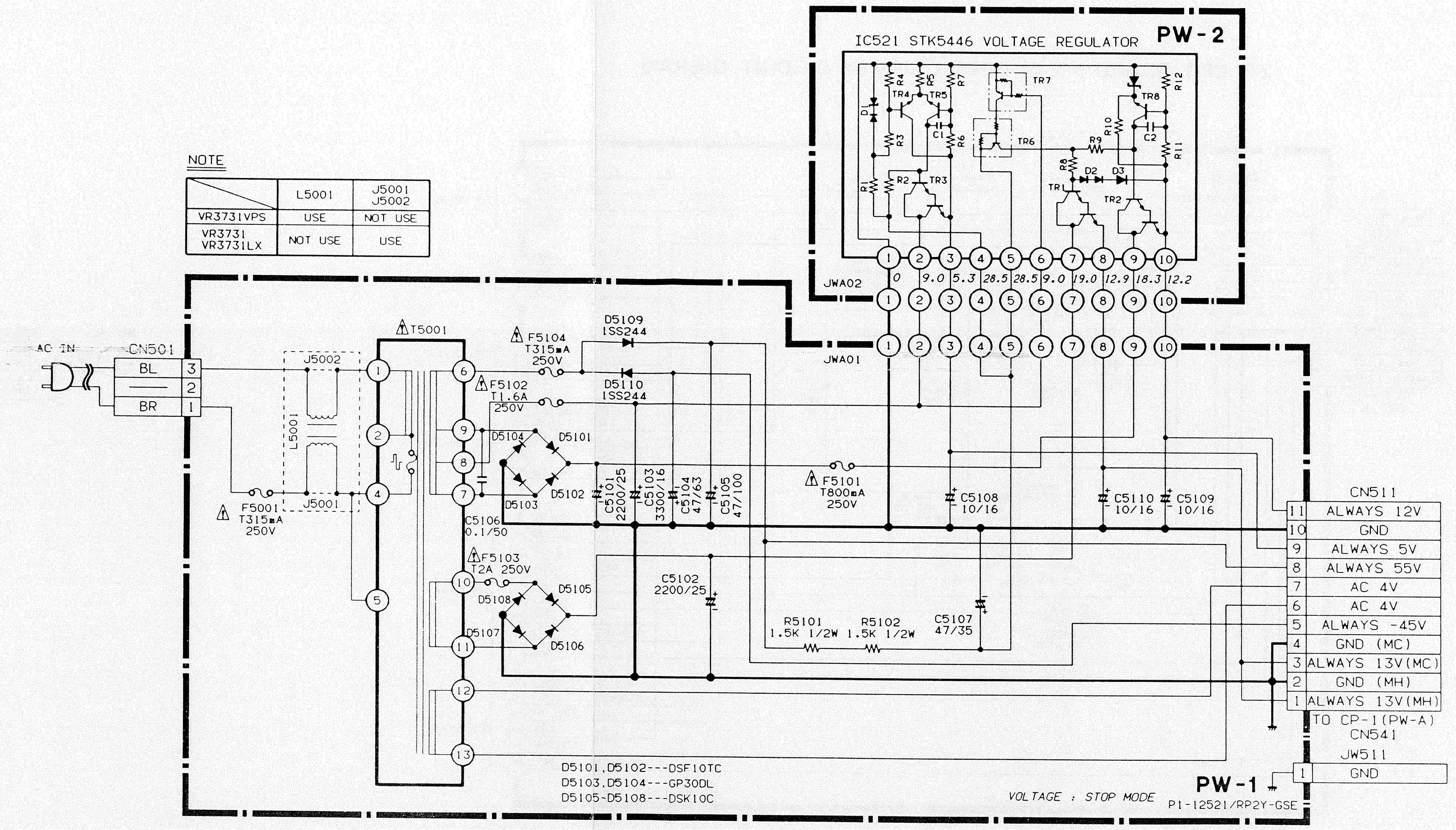
2-4. PW-1 CIRCUIT BOARD


F5001
T315mA 250V
JCI-N1S
PW-1 1AC4B11A19100C
F5103 T2A 250V
J5104
PR511
13
12
1
11
2
10
3
9
4
8
5
7
6
F5102 T1.6A
CN501
BR
BL
1(BR)
3(BL)
C5001
D5109
D5110
C5104
J5002
J5001
J5003
L5001
T5001
Y5101
ALL LO. NO. 5001---
F5104 T315mA 250V
D5103
C5106

DIGRAM


SWD 5V
SWD 12V
ALWAYS 12V
GND
TO VD-A
GND
SWD 5V
ALWAYS 5V
TO CV-A
SWD 12V
GND
ALWAYS 5V
TO AD-A
ALWAYS 12V
ALWAYS 33V
ALWAYS 5V
SWD 5V
TO TN-A
SWD 5V
POWER UP
ALWAYS 5V
ALWAYS -30V
AC 4V
AC 4V
GND
ALWAYS 13V(MC)
GND(MC)
TO SY-A
GND(MC)
ALWAYS 13V(MC)
SWD 5V
GND
GND(MH)
ALWAYS 13V(MH)
TO SV-A
VOLTAGE : STOP MODE

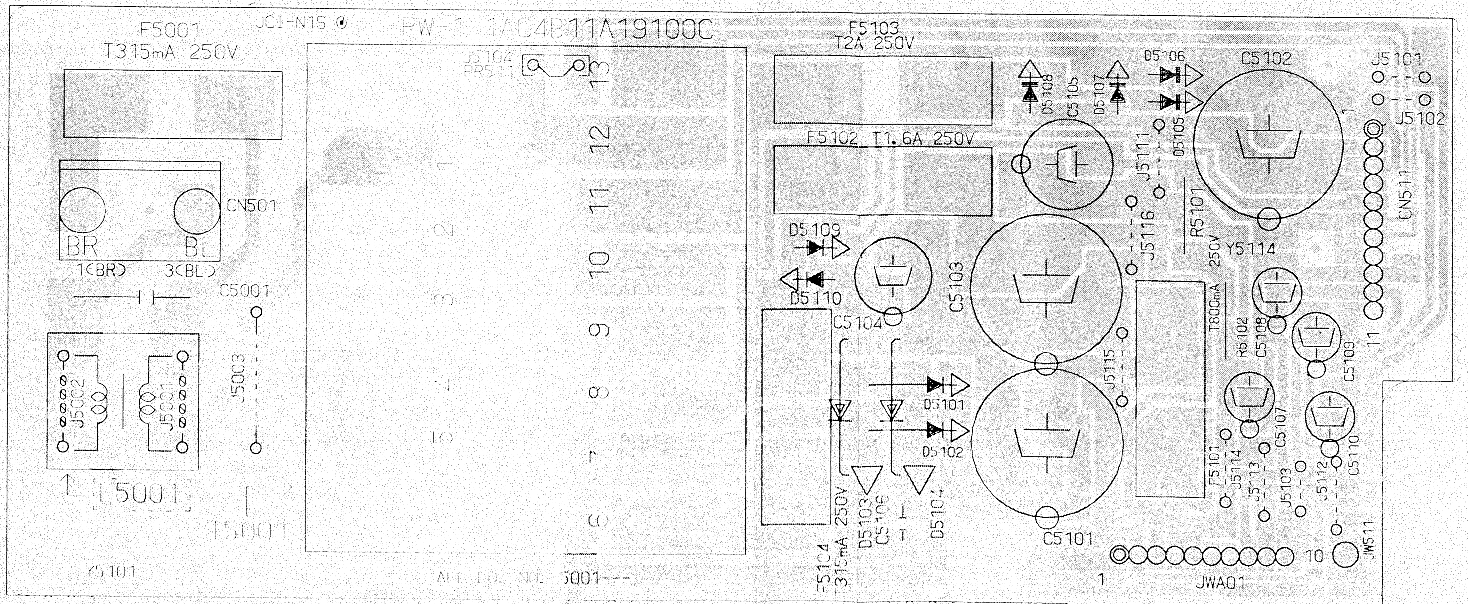
2-3. PW-1, 2 BOARD POWER SUPPLY CIRCUIT DIAGRAM


IC521 STK5446 VOLTAGE REGULATOR
PW-2
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
R12
D1
D2
D3
C1
C2
TR1
TR2
TR3
TR4
TR5
TR6
TR7
TR8
JWA02
JWA01
0
9.0
5.3
28.5
28.5
9.0
19.0
12.9
18.3
12.2
AC IN
CN501
BL
BR
3
2
1
J5002
L5001
J5001
F5001
T315mA
250V
T5001
F5104
T315mA
250V
D5109
1SS244
F5102
T1.6A
250V
D5110
1SS244
D5104
D5101
D5103
D5102
C5106
0.1/50
C5101
2200/25
C5103
3300/16
C5104
47/63
C5105
47/100
F5101
T800mA
250V
C5108
10/16
C5110
10/16
C5109
10/16
F5103
T2A 250V
D5108
D5105
D5107
D5106
C5102
2200/25
R5101
1.5K 1/2W
R5102
1.5K 1/2W
C5107
47/35
CN511
11 ALWAYS 12V
10 GND
9 ALWAYS 5V
8 ALWAYS 55V
7 AC 4V
6 AC 4V
5 ALWAYS -45V
4 GND (MC)
3 ALWAYS 13V(MC)
2 GND (MH)
1 ALWAYS 13V(MH)
TO CP-1(PW-A)
CN541
JW511
1 GND
D5101,D5102---DSF10TC
D5103,D5104---GP30DL
D5105-D5108---DSK10C
VOLTAGE : STOP MODE
PW-1
P1-12521/RP2Y-GSE

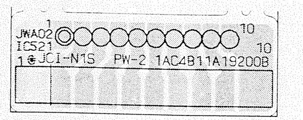
NOTE

	L5001	J5001 J5002
VR3731VPS	USE	NOT USE
VR3731 VR3731LX	NOT USE	USE

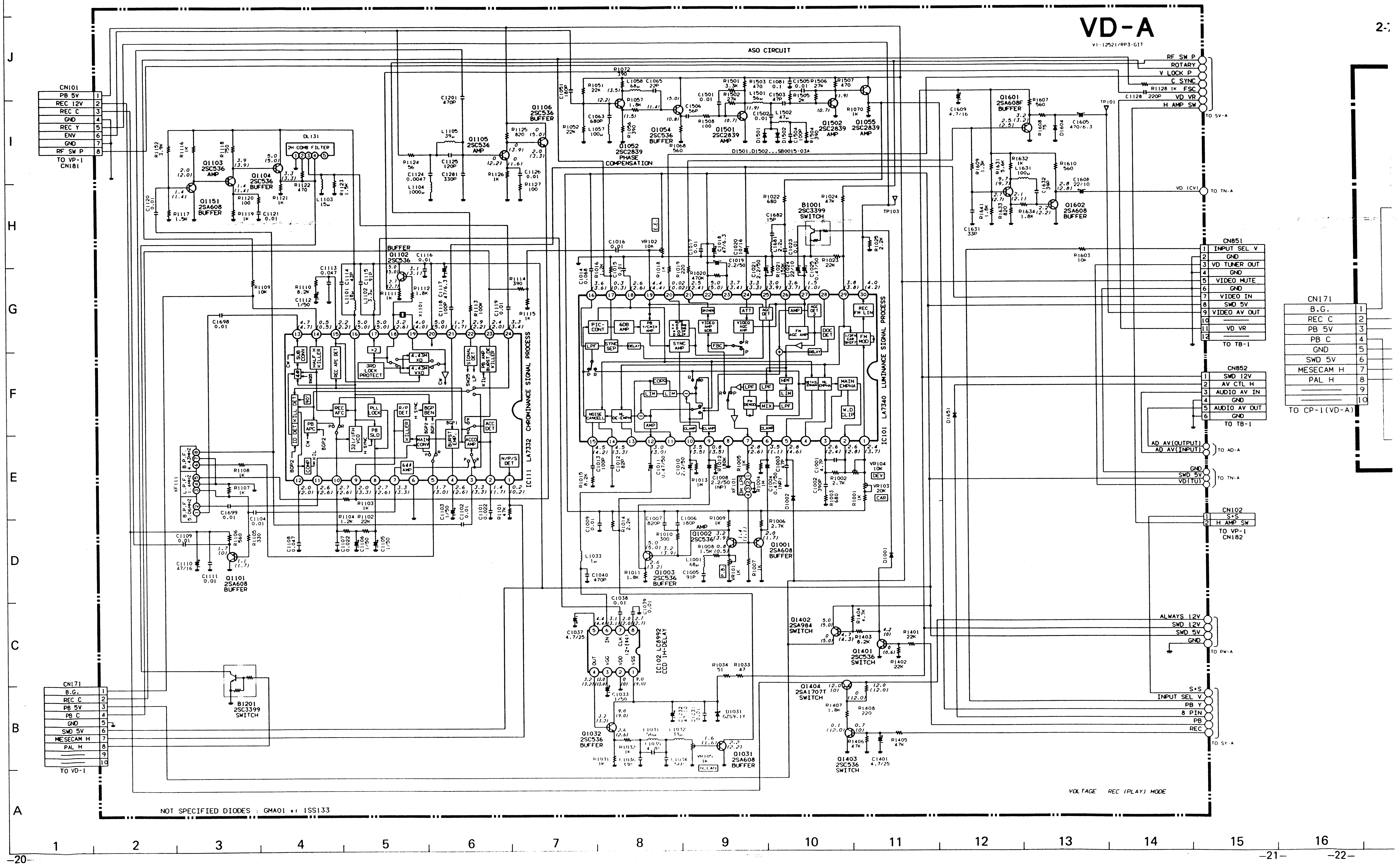
2-4. PW-1 CIRCUIT BOARD


F5001
T315mA 250V
JCI-N15
PW-1 1AC4B11A19100C
J5104
PR5111
CN501
BR
BL
1(BR)
3(BL)
C5001
J5002
J5001
J5003
T5001
Y5101
F5103
T2A 250V
F5102 T1.6A 250V
D5108
C5105
D5107
D5106
D5105
C5102
J5101
J5102
CN511
J5111
J5116
R5101
250V
T800mA
Y5114
F5101
D5109
D5110
C5104
C5103
J5115
R5102
C5108
C5109
C5107
C5110
D5101
D5102
D5103
C5106
D5104
C5101
F5104
T315mA 250V
J5114
J5113
J5103
J5112
JW511
JWA01
1
10
11
ALL I.D. NO. 5001---

2-5. PW-2 CIRCUIT BOARD


JWA02
IC521
1
10
JCI-N15
PW-2 1AC4B11A19200B

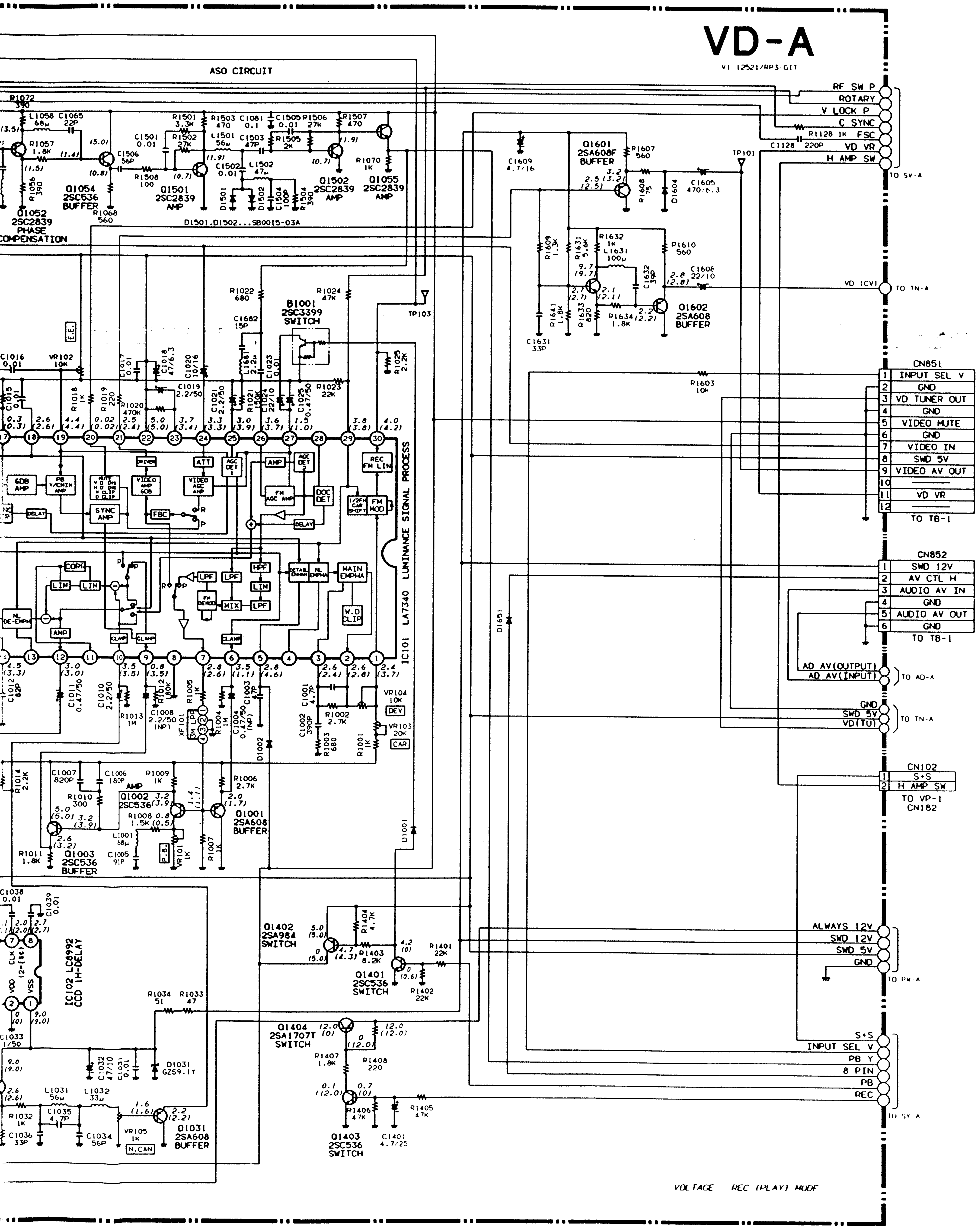
2-6. CP-1 BOARD (VD-A) VIDEO CIRCUIT DIAGRAM


VD-A
V1-12521/RP3-G1T
ASO CIRCUIT
CN101
PB 5V
REC 12V
REC C
GND
REC Y
ENV
GND
RF SW P
TO VP-1 CN181
DL131
2H COMB FILTER
Q1103 2SC536 AMP
Q1104 2SC536 BUFFER
Q1151 2SA608 BUFFER
Q1105 2SC536 AMP
Q1106 2SC536 BUFFER
Q1052 2SC2839 PHASE COMPENSATION
Q1054 2SC536 BUFFER
Q1501 2SC2839 AMP
Q1502 2SC2839 AMP
Q1055 2SC2839 AMP
D1501,D1502...SB0015-03A
Q1601 2SA608F BUFFER
Q1602 2SA608 BUFFER
RF SW P
ROTARY
V LOCK P
C SYNC
R1128 1K FSC
VD VR
H AMP SW
TO SV-A
VD (CV)
TO TN-A
TP101
TP103
B1001 2SC3399 SWITCH
Q1102 2SC536 BUFFER
IC111 LA7332 CHROMINANCE SIGNAL PROCESS
IC101 LA7340 LUMINANCE SIGNAL PROCESS
XF111
B.P.F. 4.43MHz
L.P.F. 1.4MHz
B.P.F. 5.06MHz
Q1101 2SA608 BUFFER
CN851
INPUT SEL V
GND
VD TUNER OUT
GND
VIDEO MUTE
GND
VIDEO IN
SWD 5V
VIDEO AV OUT
VD VR
TO TB-1
CN852
SWD 12V
AV CTL H
AUDIO AV IN
GND
AUDIO AV OUT
GND
TO TB-1
AD AV(OUTPUT)
AD AV(INPUT)
TO AD-A
GND
SWD 5V
VD(TU)
TO TN-A
CN102
S+S
H AMP SW
TO VP-1 CN182
CN171
B.G.
REC C
PB 5V
PB C
GND
SWD 5V
MESECAM H
PAL H
TO CP-1(VD-A)
Q1002 2SC536 AMP
Q1001 2SA608 BUFFER
Q1003 2SC536 BUFFER
IC102 LC8992 CCD 1H-DELAY
Q1032 2SC536 BUFFER
Q1031 2SA608 BUFFER
D1031 GZ5.9-1Y
Q1402 2SA984 SWITCH
Q1401 2SC536 SWITCH
Q1404 2SA1707T SWITCH
Q1403 2SC536 SWITCH
ALWAYS 12V
SWD 12V
SWD 5V
GND
TO PW-A
S+S
INPUT SEL V
PB Y
8 PIN
PB
REC
TO SY-A
CN171
B.G.
REC C
PB 5V
PB C
GND
SWD 5V
MESECAM H
PAL H
TO VD-1
B1201 2SC3399 SWITCH
K
J
I
H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

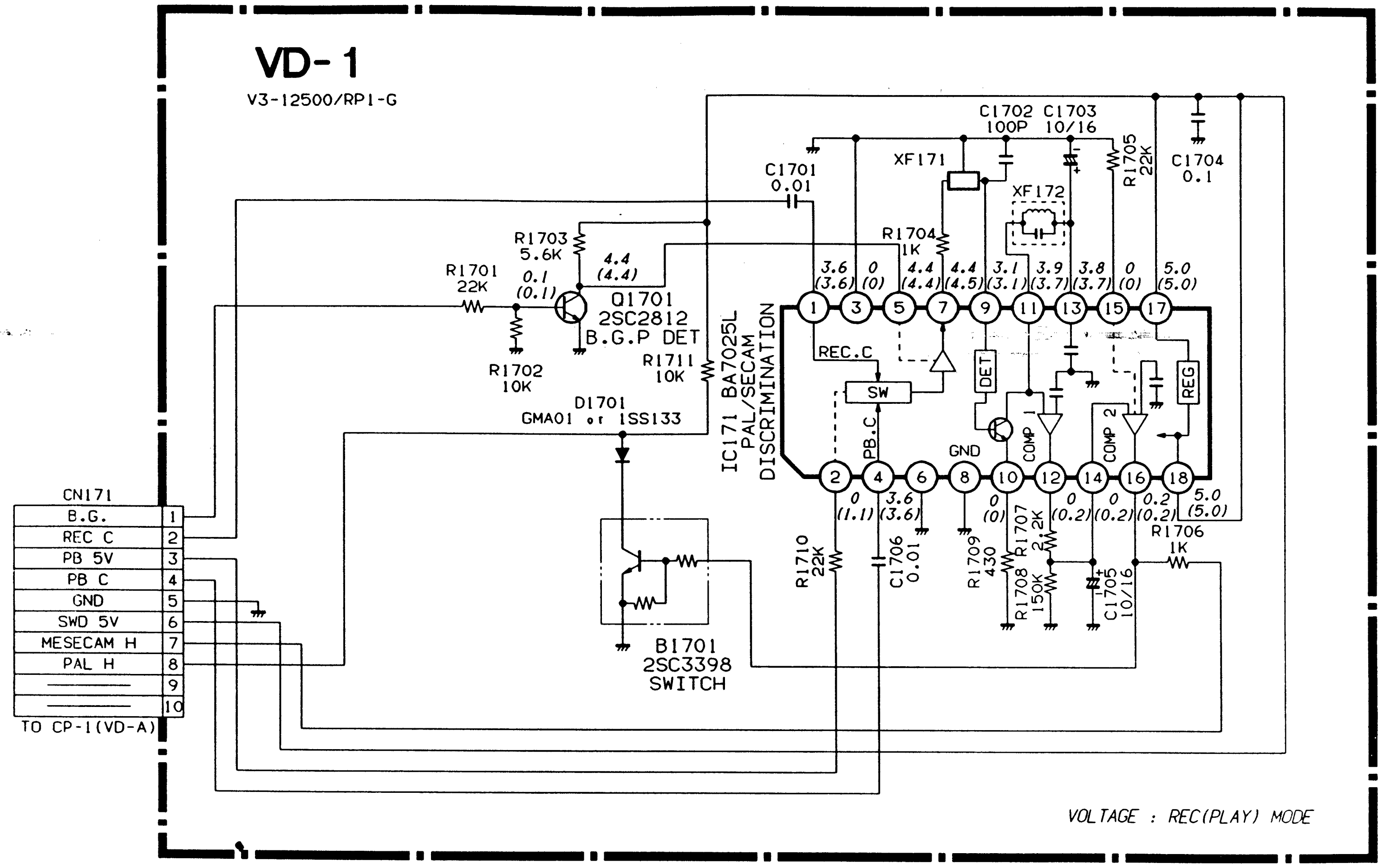
NOT SPECIFIED DIODES : GMA01 or 1SS133

VOLTAGE REC (PLAY) MODE

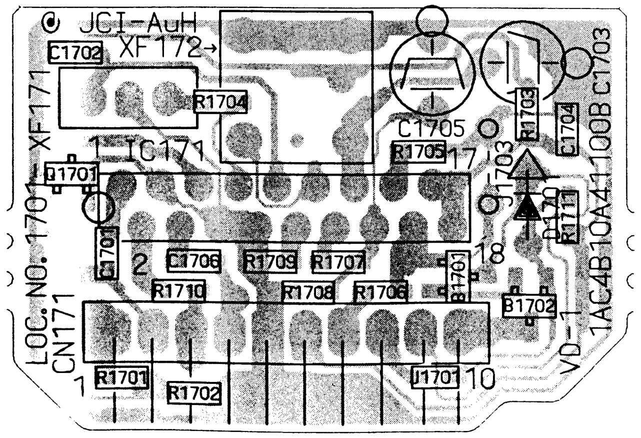
A) VIDEO CIRCUIT DIAGRAM


VD-A
V1-12521/RP3-G11
ASO CIRCUIT
RF SW P
ROTARY
V LOCK P
C SYNC
R1128 1K FSC
C1128 220P
VD VR
H AMP SW
TO SV-A
Q1052 2SC2839 PHASE COMPENSATION
Q1054 2SC536 BUFFER
Q1501 2SC2839 AMP
Q1502 2SC2839 AMP
Q1055 2SC2839 AMP
D1501,D1502...SB0015-03A
Q1601 2SA608F BUFFER
Q1602 2SA608 BUFFER
TP101
TP103
VD (CV1)
TO TN-A
B1001 2SC3399 SWITCH
E.E
CN851
1 INPUT SEL V
2 GND
3 VD TUNER OUT
4 GND
5 VIDEO MUTE
6 GND
7 VIDEO IN
8 SWD 5V
9 VIDEO AV OUT
10
11 VD VR
12
TO TB-1
CN852
1 SWD 12V
2 AV CTL H
3 AUDIO AV IN
4 GND
5 AUDIO AV OUT
6 GND
TO TB-1
IC101 LA7340 LUMINANCE SIGNAL PROCESS
AD AV(OUTPUT)
AD AV(INPUT)
TO AD-A
GND
SWD 5V
VD(TU)
TO TN-A
VR104 10K DEV
VR103 20K CAR
CN102
1 S+S
2 H AMP SW
TO VP-1 CN182
Q1002 2SC536 AMP
Q1001 2SA608 BUFFER
Q1003 2SC536 BUFFER
IC102 LC8992 CCD 1H-DELAY
Q1031 2SA608 BUFFER
D1031 GZS9.1T
VR105 1K N.CAN
Q1402 2SA984 SWITCH
Q1401 2SC536 SWITCH
Q1404 2SA1707T SWITCH
Q1403 2SC536 SWITCH
ALWAYS 12V
SWD 12V
SWD 5V
GND
TO PM-A
S+S
INPUT SEL V
PB Y
8 PIN
PB
REC
TO SY-A
VOLTAGE REC (PLAY) MODE

2-7. VD-1 BOARD PAL/SECAM DISCRIMINATION CIRCUIT DIAGRAM

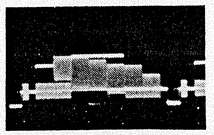
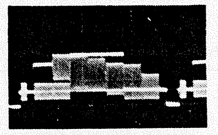
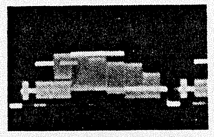
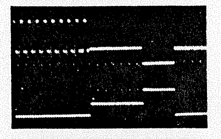
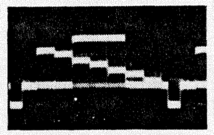
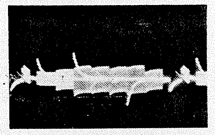
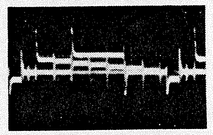
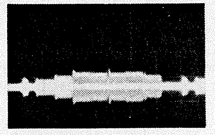
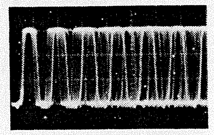
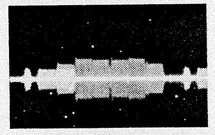
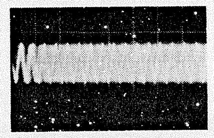
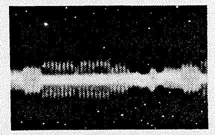
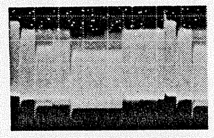
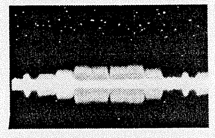
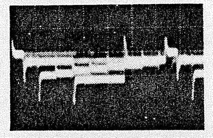
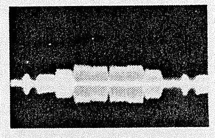
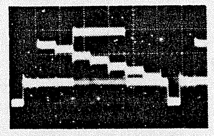
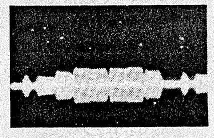
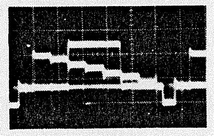
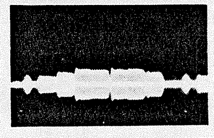
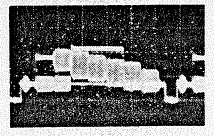
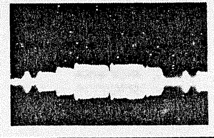

VD-1
V3-12500/RP1-G
C1702 100P
C1703 10/16
C1701 0.01
XF171
XF172
R1705 22K
C1704 0.1
R1703 5.6K
R1704 1K
R1701 22K
Q1701 2SC2812 B.G.P DET
R1702 10K
R1711 10K
D1701 GMA01 or 1SS133
IC171 BA7025L PAL/SECAM DISCRIMINATION
REC.C
SW
PB.C
GND
DET
COMP
COMP 2
REG
R1710 22K
C1706 0.01
R1709 430
R1707 2.2K
R1708 150K
C1705 10/16
R1706 1K
B1701 2SC3398 SWITCH
CN171
1 B.G.
2 REC C
3 PB 5V
4 PB C
5 GND
6 SWD 5V
7 MESECAM H
8 PAL H
9
10
TO CP-1(VD-A)
VOLTAGE : REC(PLAY) MODE

2-8. VD-1 CIRCUIT BOARD

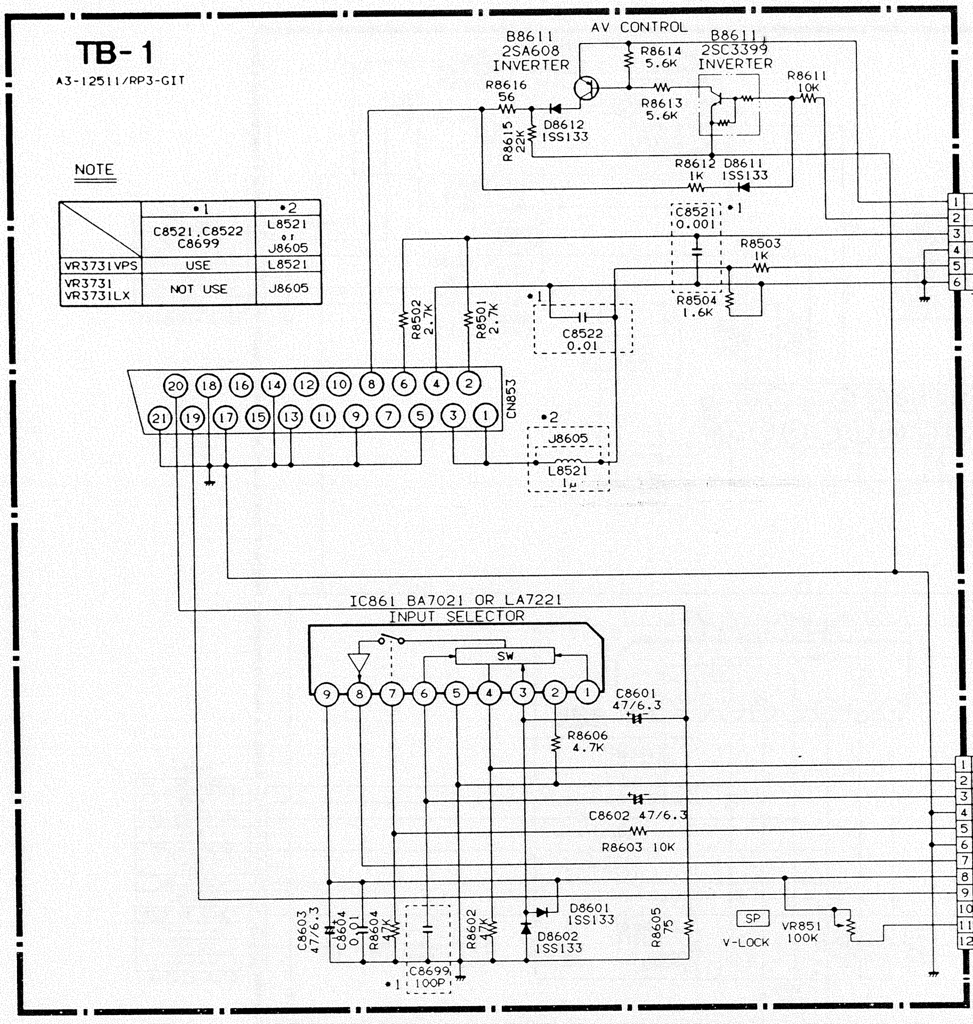

JCI-AuH
C1702
XF172
XF171
R1704
IC171
C1705
R1705
Q1701
R1703
C1704
C1703
D1701
R1711
C1701
C1706
R1709
R1707
R1710
R1708
R1706
B1701
B1702
R1701
R1702
J1701
CN171
LOC. NO. 1701
1AC4B10A41100B
VD-1

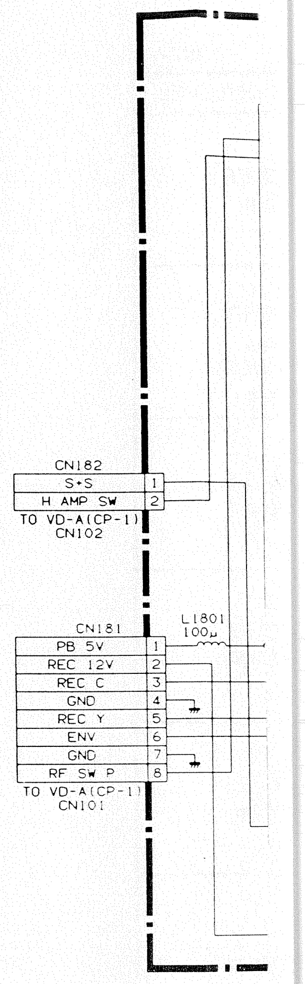
2-9. WAVEFORM OF VIDEO

WF-V5

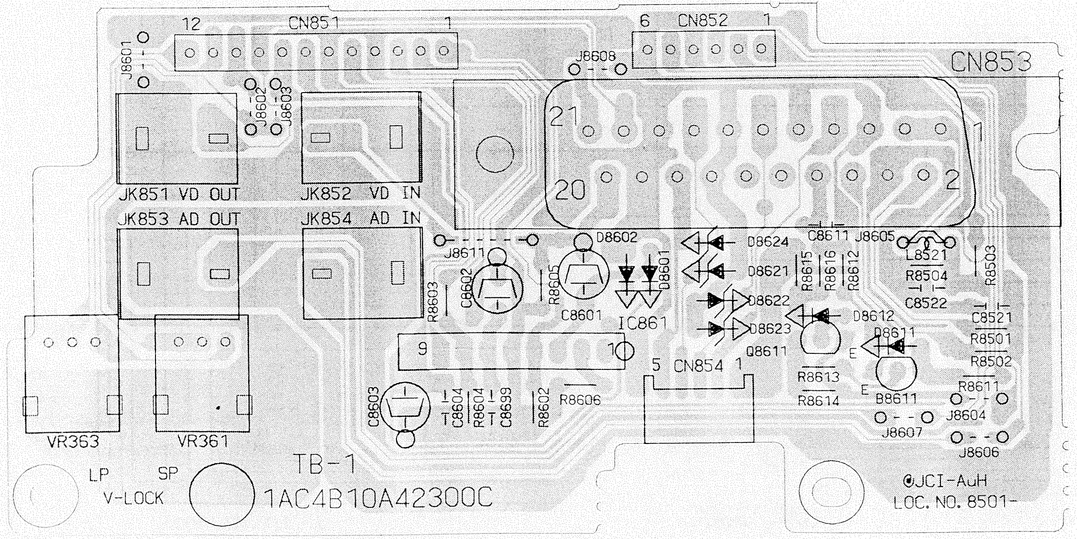
TEST LOCATION	WAVEFORM	MODE/LEVEL	TEST LOCATION	WAVEFORM	MODE/LEVEL
IC101 Pin 24		REC, EE 1 Vp-p	IC101 Pin 21		REC, EE 2 Vp-p
IC101 Pin 7		REC, EE 1 Vp-p	IC101 (UPPER) Pin 21 (LOWER) Pin 20		STILL (UPPER) 2 Vp-p (LOWER) 5 Vp-p
IC101 Pin 6		REC, EE 0.45 Vp-p	IC111 Pin 21		REC, EE 1 Vp-p
IC101 Pin 2		REC, EE 1.3 Vp-p	IC111 Pin 3		REC, EE 0.14 Vp-p
IC101 Pin 30		REC, EE 1.5 Vp-p	IC111 Pin 9		REC, EE 0.8Vp-p
IC101 Pin 26		PB 0.3 Vp-p	Q1105 Base		PB 0.1 Vp-p
IC101 Pin 7		PB 2.0 Vp-p	Q1106 Emitter		PB 0.8 Vp-p
Q1002 Base		PB 0.5 Vp-p	IC111 Pin 7		PB 0.3 Vp-p
IC101 Pin 9		PB 0.6 Vp-p	IC111 Pin 5		PB 1.2 Vp-p
IC101 Pins 10/12		PB 0.5 Vp-p	IC111 Pin 24		PB 0.24 Vp-p
IC101 Pin 21		PB 2 Vp-p	IC111 Pin 23		PB 0.7 Vp-p

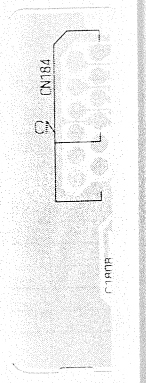
2-10. TB-1 BOARD TERMINAL CIRCUIT DIAGRAM


TB-1
A3-12511/RP3-GIT
NOTE
*1 / *2
C8521, C8522, C8699 / L8521 or J8605
VR3731VPS: USE / L8521
VR3731 VR3731LX: NOT USE / J8605
AV CONTROL
B8611 2SA608 INVERTER
B8611 2SC3399 INVERTER
R8614 5.6K
R8613 5.6K
R8616 56
R8615 22K
D8612 1SS133
R8611 10K
R8612 1K
D8611 1SS133
C8521 0.001
R8503 1K
R8504 1.6K
C8522 0.01
R8502 2.7K
R8501 2.7K
CN853
J8605
L8521 1μ
CN852
1 SWD 12V
2 AV CTL.H
3 AUDIO AV IN
4 GND
5 AUDIO AV OUT
6 GND
TO CP-1(VD-A)
IC861 BA7021 OR LA7221
INPUT SELECTOR
SW
C8601 47/6.3
R8606 4.7K
C8602 47/6.3
R8603 10K
CN851
1 INPUT SEL V
2 GND
3 VD TUNER IN
4 GND
5 VIDEO MUTE
6 GND
7 VIDEO IN
8 SWD 5V
9 VIDEO AV OUT
10
11 VD VR
12
TO CP-1(VD-A)
C8603 47/6.3
C8604 0.01
R8604
R8602
D8601 1SS133
D8602 1SS133
R8605 75
C8699 *1 100P
SP
V-LOCK
VR851 100K


CN182
S•S
H AMP SW
TO VD-A(CP-1) CN102
CN181
PB 5V
REC 12V
REC C
GND
REC Y
ENV
GND
RF SW P
TO VD-A(CP-1) CN101
L1801 100μ

2-11. TB-1 CIRCUIT BOARD


12 CN851 1
6 CN852 1
CN853
21
20
1
2
J8601
J8602
J8603
J8608
JK851 VD OUT
JK852 VD IN
JK853 AD OUT
JK854 AD IN
J8611
C8602
D8602
D8601
D8624
D8621
D8622
D8623
C8611 J8605
R8615
R8616
R8612
L8521
R8504
R8503
C8522
C8521
R8501
R8502
R8603
R8605
C8601
IC861
9
1
5 CN854 1
D8612
D8611
Q8611
R8613
R8614
B8611
R8611
J8604
J8607
J8606
C8603
C8604
C8604
C8699
R8602
R8606
VR353
VR361
LP
SP
V-LOCK
TB-1
1AC4B10A42300C
©JCI-AuH
LOC. NO. 8501-



WF-V5

DE/LEVEL

C, EE
p-p

L
ER)
p
WER)
p-p

C, EE
p-p

C, EE
Vp-p

C, EE
Vp-p

Vp-p

Vp-p

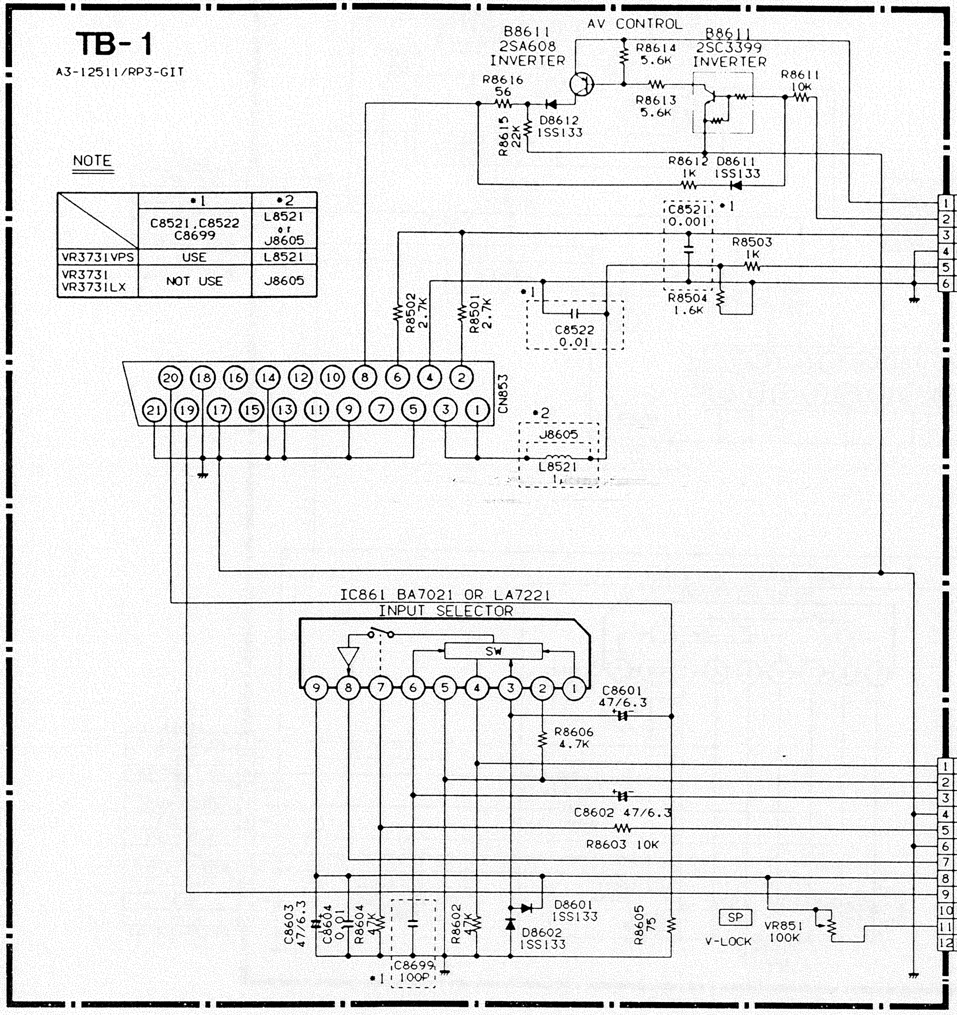
Vp-p

Vp-p

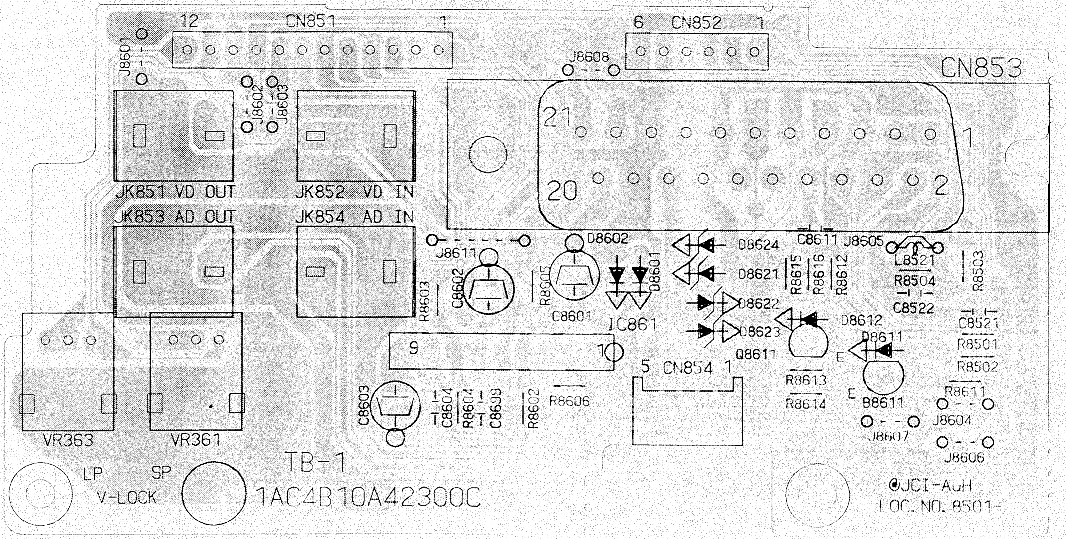
Vp-p

Vp-p

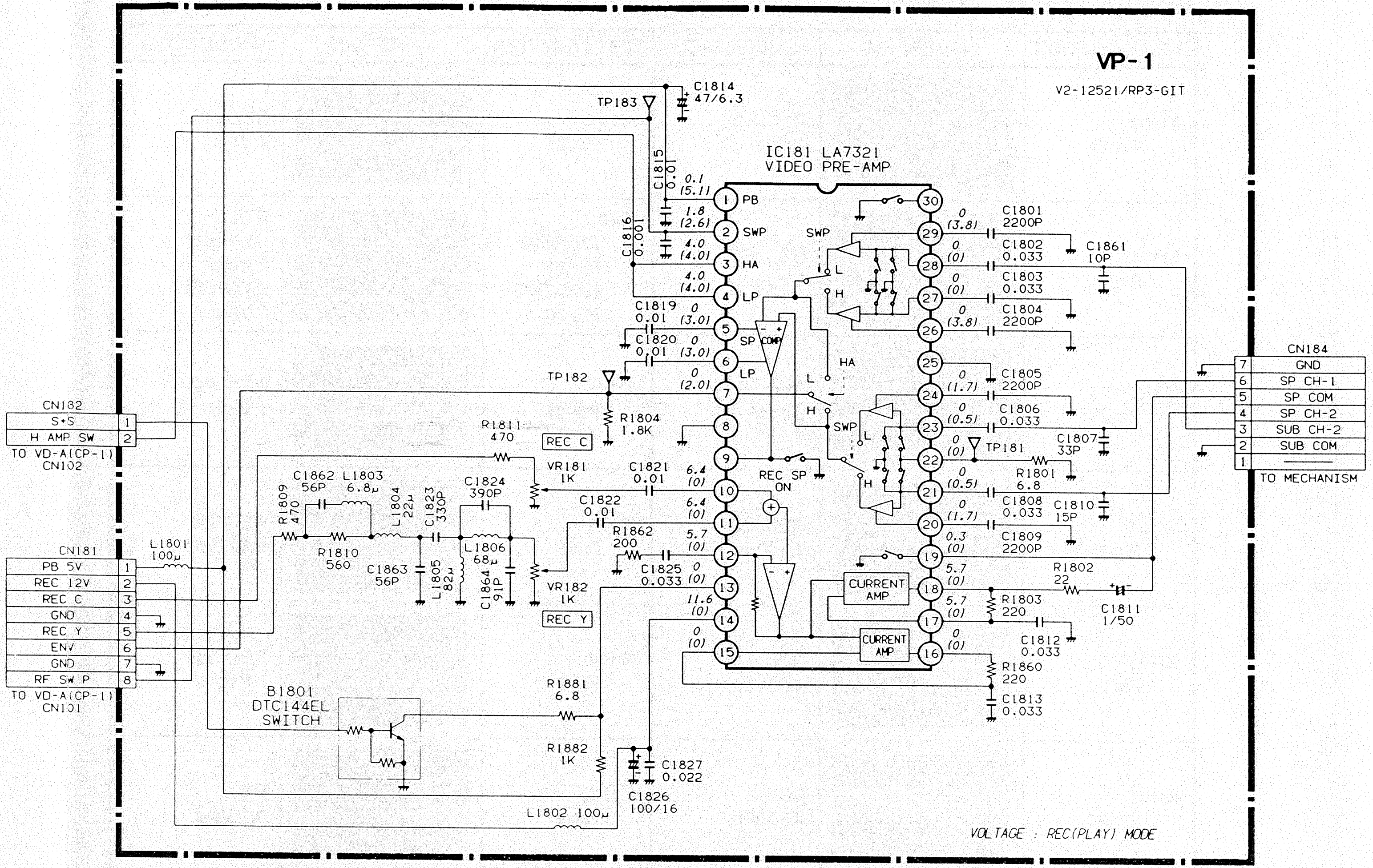
2-10. TB-1 BOARD TERMINAL CIRCUIT DIAGRAM


TB-1
A3-12511/RP3-GIT
NOTE
*1
*2
C8521, C8522 C8699
L8521 or J8605
VR3731VPS
USE
L8521
VR3731 VR3731LX
NOT USE
J8605
AV CONTROL
B8611 2SA608 INVERTER
B8611 2SC3399 INVERTER
R8614 5.6K
R8613 5.6K
R8616 56
R8611 10K
D8612 1SS133
R8615 22K
R8612 1K
D8611 1SS133
C8521 0.001
R8503 1K
R8504 1.6K
C8522 0.01
R8502 2.7K
R8501 2.7K
CN853
J8605
L8521
CN852
1 SWD 12V
2 AV CTL.H
3 AUDIO AV IN
4 GND
5 AUDIO AV OUT
6 GND
TO CP-1(VD-A)
IC861 BA7021 OR LA7221
INPUT SELECTOR
SW
C8601 47/6.3
R8606 4.7K
C8602 47/6.3
R8603 10K
CN851
1 INPUT SEL V
2 GND
3 VD TUNER IN
4 GND
5 VIDEO MUTE
6 GND
7 VIDEO IN
8 SWD 5V
9 VIDEO AV OUT
10
11 VD VR
12
TO CP-1(VD-A)
C8603 47/6.3
C8604 0.01
R8604 47K
R8602 47K
D8601 1SS133
D8602 1SS133
R8605 75
C8699 100P
SP
V-LOCK
VR851 100K

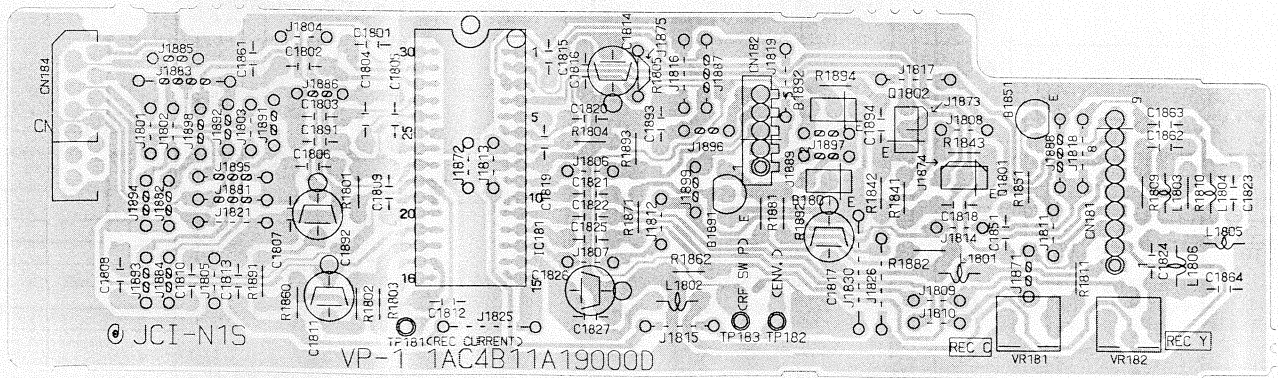
2-11. TB-1 CIRCUIT BOARD


CN851
CN852
CN853
JK851 VD OUT
JK852 VD IN
JK853 AD OUT
JK854 AD IN
IC861
CN854
VR363
VR361
LP
SP
V-LOCK
TB-1
1AC4B10A42300C
@JCI-AUH
LOC. NO. 8501-

2-12. VP-1 BOARD VIDEO PRE-AMP CIRCUIT DIAGRAM

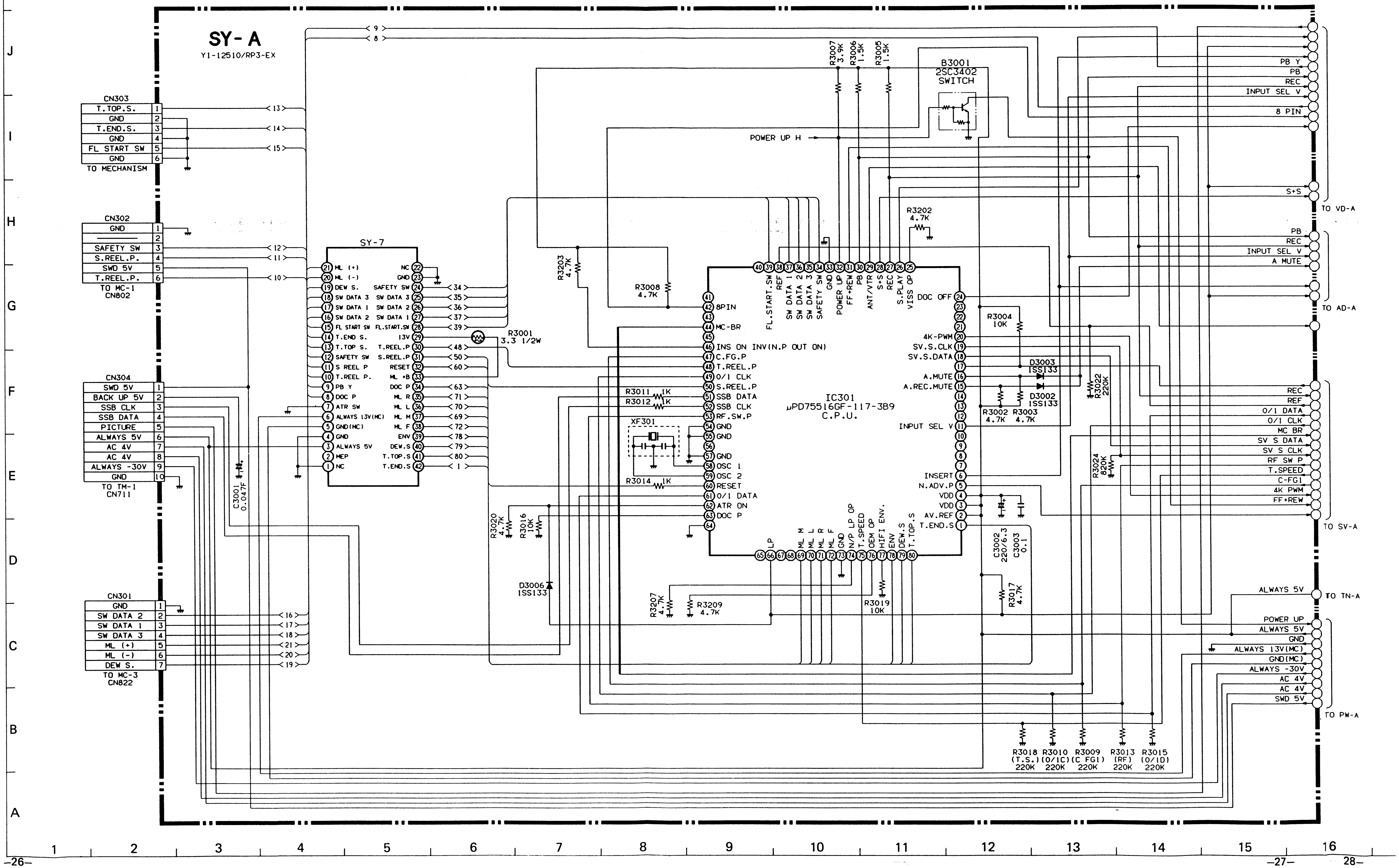

VP-1
V2-12521/RP3-GIT
IC181 LA7321
VIDEO PRE-AMP
TP183
C1814 47/6.3
C1815 0.01
C1816 0.001
PB
SWP
HA
LP
SP
REC SP ON
CURRENT AMP
C1801 2200P
C1802 0.033
C1803 0.033
C1804 2200P
C1805 2200P
C1806 0.033
C1807 33P
C1808 0.033
C1809 2200P
C1810 15P
C1811 1/50
C1812 0.033
C1813 0.033
C1861 10P
C1819 0.01
C1820 0.01
TP182
TP181
R1804 1.8K
R1811 470
REC C
REC Y
VR181 1K
VR182 1K
C1822 0.01
C1824 390P
C1862 56P
L1803 6.8μ
L1804 22μ
C1823 330P
R1809 470
R1810 560
C1863 56P
L1805 82μ
C1864 91P
L1806 68μ
R1862 200
C1825 0.033
R1801 6.8
R1802 22
R1803 220
R1860 220
R1881 6.8
R1882 1K
C1827 0.022
C1826 100/16
L1801 100μ
L1802 100μ
B1801 DTC144EL SWITCH
CN182
1 S-S
2 H AMP SW
TO VD-A(CP-1) CN102
CN181
1 PB 5V
2 REC 12V
3 REC C
4 GND
5 REC Y
6 ENV
7 GND
8 RF SW P
TO VD-A(CP-1) CN101
CN184
7 GND
6 SP CH-1
5 SP COM
4 SP CH-2
3 SUB CH-2
2 SUB COM
1
TO MECHANISM
VOLTAGE : REC(PLAY) MODE

2-13. VP-1 CIRCUIT BOARD


CN184
VR181
VR182
REC C
REC Y
TP183
TP182
@JCI-N1S
VP-1 1AC4B11A19000D

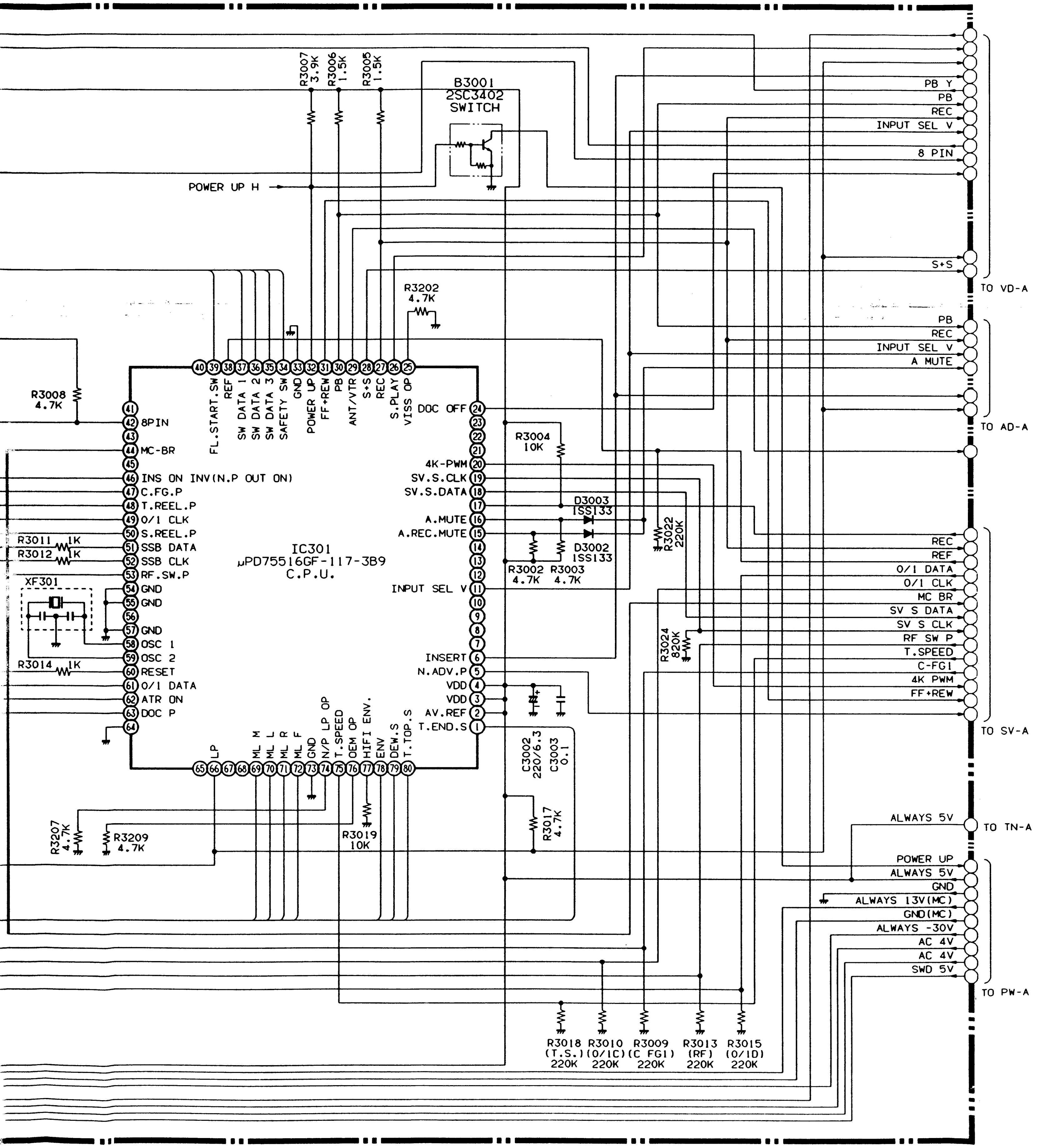
2-14. CP-1 BOARD (SY-A) SYSTEM CONTROL CIRCUIT DIAGRAM

The SY-7 circuit diagram is published in the pages 49 ~ 50.


SY- A
Y1-12510/RP3-EX
CN303
T.TOP.S.
GND
T.END.S.
GND
FL START SW
GND
TO MECHANISM
CN302
GND
SAFETY SW
S.REEL.P.
SWD 5V
T.REEL.P.
TO MC-1
CN802
CN304
SWD 5V
BACK UP 5V
SSB CLK
SSB DATA
PICTURE
ALWAYS 5V
AC 4V
AC 4V
ALWAYS -30V
GND
TO TM-1
CN711
C3001
0.047F
CN301
GND
SW DATA 2
SW DATA 1
SW DATA 3
ML (+)
ML (-)
DEW S.
TO MC-3
CN822
SY-7
ML (+)
ML (-)
DEW S.
SW DATA 3
SW DATA 1
SW DATA 2
FL START SW
T.END S.
T.TOP S.
SAFETY SW
S REEL P
T.REEL P.
PB Y
DOC P
ATR SW
ALWAYS 13V(MC)
GND(MC)
GND
ALWAYS 5V
MEP
NC
NC
GND
SAFETY SW
SW DATA 3
SW DATA 2
SW DATA 1
FL.START.SW
13V
T.REEL.P
S.REEL.P
RESET
ML +B
DOC P
ML R
ML L
ML M
ML F
ENV
DEW.S
T.TOP.S
T.END.S
R3001
3.3 1/2W
R3203
4.7K
R3008
4.7K
R3007
3.9K
R3006
1.5K
R3005
1.5K
B3001
2SC3402
SWITCH
POWER UP H
R3202
4.7K
FL.START.SW
REF
SW DATA 1
SW DATA 2
SW DATA 3
SAFETY SW
GND
POWER UP
FF+REW
PB
ANT/VTR
S+S
REC
S.PLAY
VISS OP
8PIN
MC-BR
INS ON INV(N.P OUT ON)
C.FG.P
T.REEL.P
O/1 CLK
S.REEL.P
SSB DATA
SSB CLK
RF.SW.P
GND
GND
GND
OSC 1
OSC 2
RESET
O/1 DATA
ATR ON
DOC P
R3011 1K
R3012 1K
XF301
R3014 1K
IC301
μPD75516GF-117-3B9
C.P.U.
DOC OFF
4K-PWM
SV.S.CLK
SV.S.DATA
A.MUTE
A.REC.MUTE
INPUT SEL V
INSERT
N.ADV.P
VDD
VDD
AV.REF
T.END.S
LP
ML M
ML L
ML R
ML F
GND
N/P LP OP
T.SPEED
OEM OP
HIFI ENV.
ENV
DEW.S
T.TOP.S
R3004
10K
D3003
1SS133
D3002
1SS133
R3002
4.7K
R3003
4.7K
R3022
220K
R3024
820K
C3002
220/6.3
C3003
0.1
R3017
4.7K
R3020
4.7K
R3016
10K
D3006
1SS133
R3207
4.7K
R3209
4.7K
R3019
10K
R3018
(T.S.)
220K
R3010
(O/1C)
220K
R3009
(C FG1)
220K
R3013
(RF)
220K
R3015
(O/1D)
220K
PB Y
PB
REC
INPUT SEL V
8 PIN
S+S
TO VD-A
PB
REC
INPUT SEL V
A MUTE
TO AD-A
REC
REF
O/1 DATA
O/1 CLK
MC BR
SV S DATA
SV S CLK
RF SW P
T.SPEED
C-FG1
4K PWM
FF+REW
TO SV-A
ALWAYS 5V
TO TN-A
POWER UP
ALWAYS 5V
GND
ALWAYS 13V(MC)
GND(MC)
ALWAYS -30V
AC 4V
AC 4V
SWD 5V
TO PW-A
K
J
I
H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

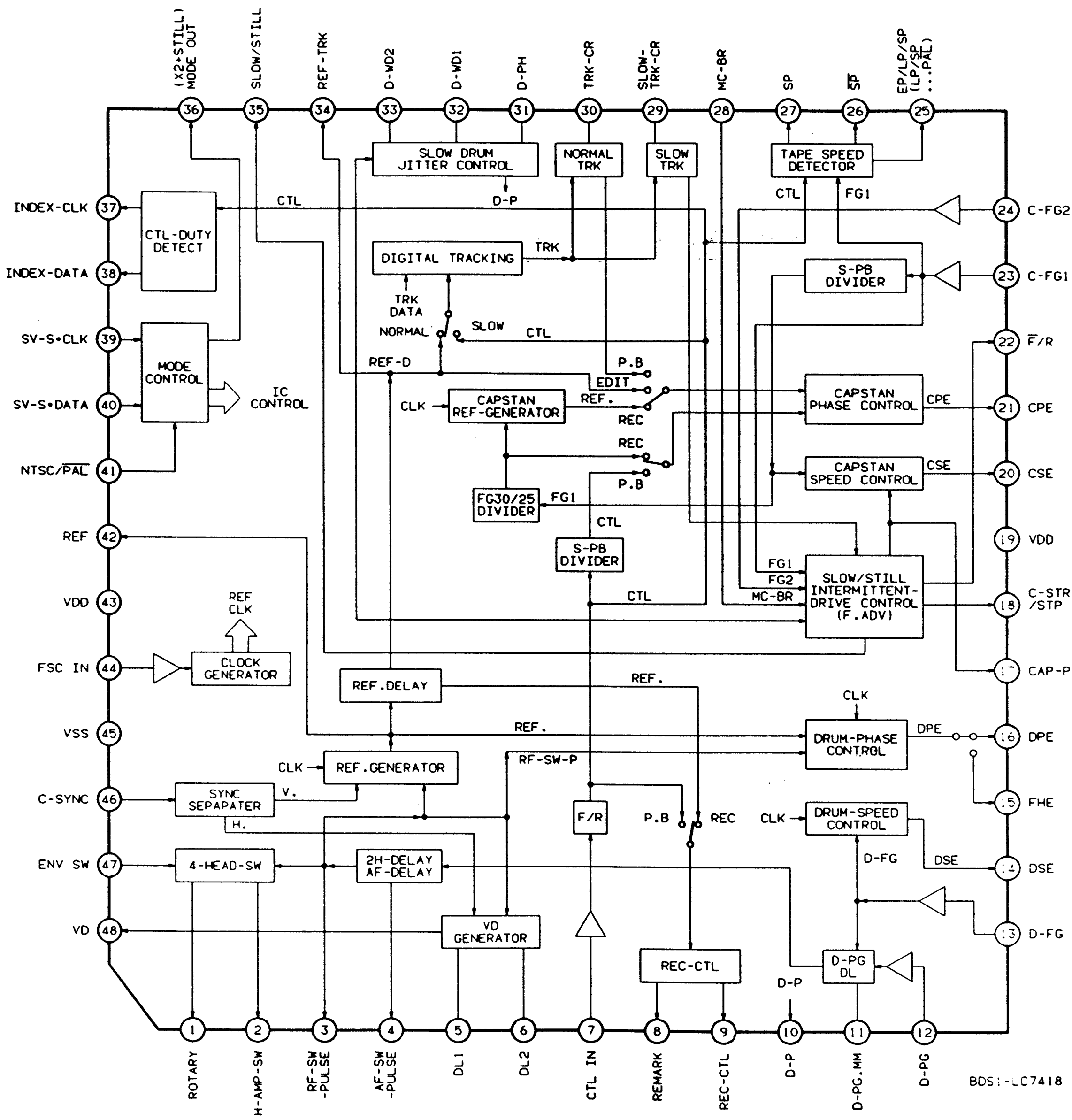
-A) SYSTEM CONTROL CIRCUIT DIAGRAM

iagram is published in the pages 49 ~ 50.



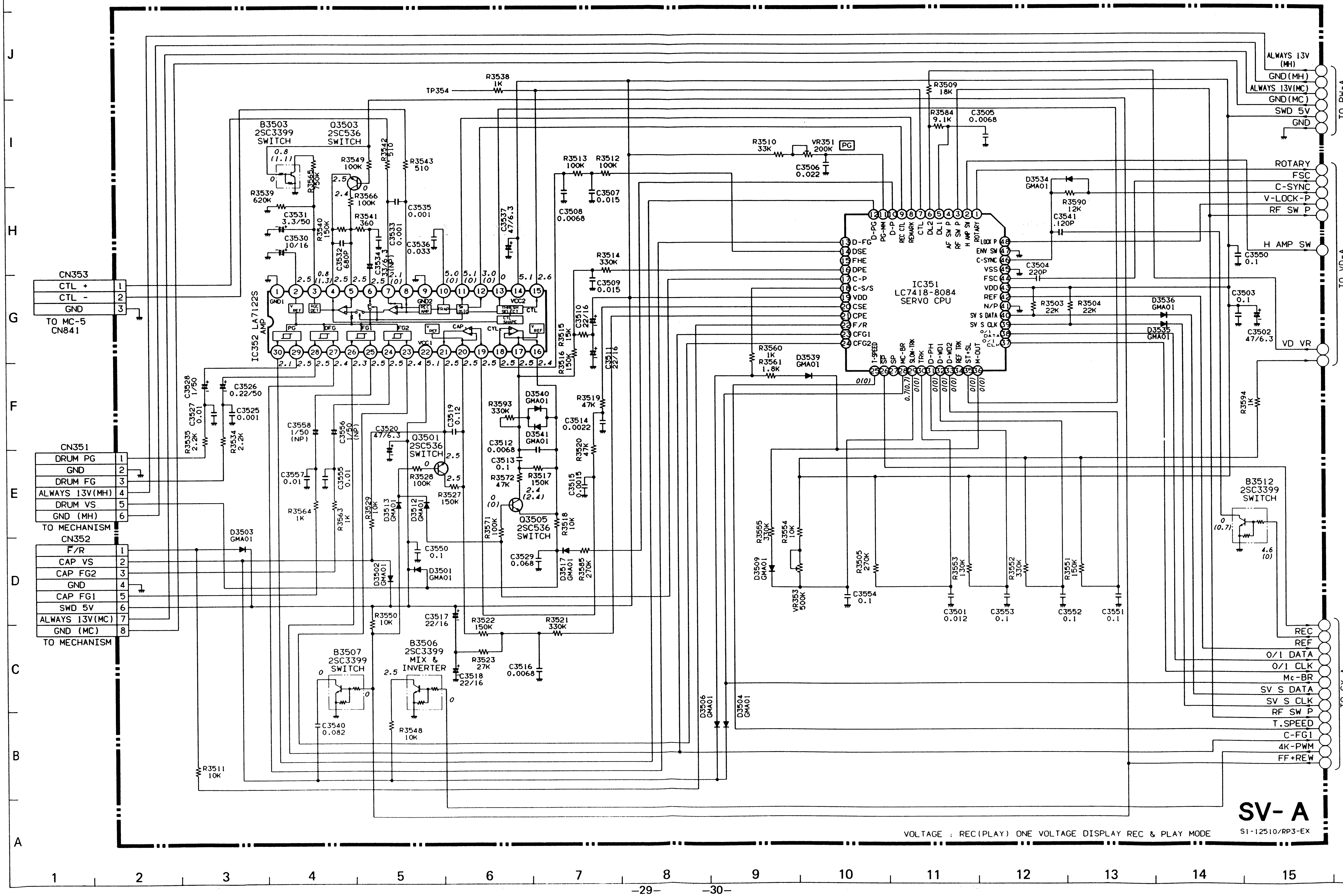
R3007 3.9K
R3006 1.5K
R3005 1.5K
B3001 2SC3402 SWITCH
POWER UP H
PB Y
PB
REC
INPUT SEL V
8 PIN
S+S
TO VD-A
R3202 4.7K
PB
REC
INPUT SEL V
A MUTE
TO AD-A
R3008 4.7K
FL.START.SW
REF
SW DATA 1
SW DATA 2
SW DATA 3
SAFETY SW
GND
POWER UP
FF+REW
PB
ANT/VTR
S+S
REC
S.PLAY
VISS OP
DOC OFF
8PIN
MC-BR
INS ON INV(N.P OUT ON)
C.FG.P
T.REEL.P
0/1 CLK
S.REEL.P
SSB DATA
SSB CLK
RF.SW.P
GND
GND
GND
OSC 1
OSC 2
RESET
0/1 DATA
ATR ON
DOC P
R3011 1K
R3012 1K
XF301
R3014 1K
IC301
μPD75516GF-117-3B9
C.P.U.
4K-PWM
SV.S.CLK
SV.S.DATA
A.MUTE
A.REC.MUTE
INPUT SEL V
INSERT
N.ADV.P
VDD
VDD
AV.REF
T.END.S
R3004 10K
D3003 1SS133
D3002 1SS133
R3002 4.7K
R3003 4.7K
R3022 220K
R3024 820K
REC
REF
0/1 DATA
0/1 CLK
MC BR
SV S DATA
SV S CLK
RF SW P
T.SPEED
C-FG1
4K PWM
FF+REW
TO SV-A
LP
ML M
ML L
ML R
ML F
GND
N/P
LP OP
T.SPEED
OEM OP
HIFI ENV.
ENV
DEW.S
T.TOP.S
C3002 220/6.3
C3003 0.1
R3017 4.7K
R3207 4.7K
R3209 4.7K
R3019 10K
ALWAYS 5V
TO TN-A
POWER UP
ALWAYS 5V
GND
ALWAYS 13V(MC)
GND(MC)
ALWAYS -30V
AC 4V
AC 4V
SWD 5V
TO PW-A
R3018 (T.S.) 220K
R3010 (0/1C) 220K
R3009 (C FG1) 220K
R3013 (RF) 220K
R3015 (0/1D) 220K

2-15. IC351 (LC7418) DIGITAL SERVO IC INTER BLOCK DIAGRAM

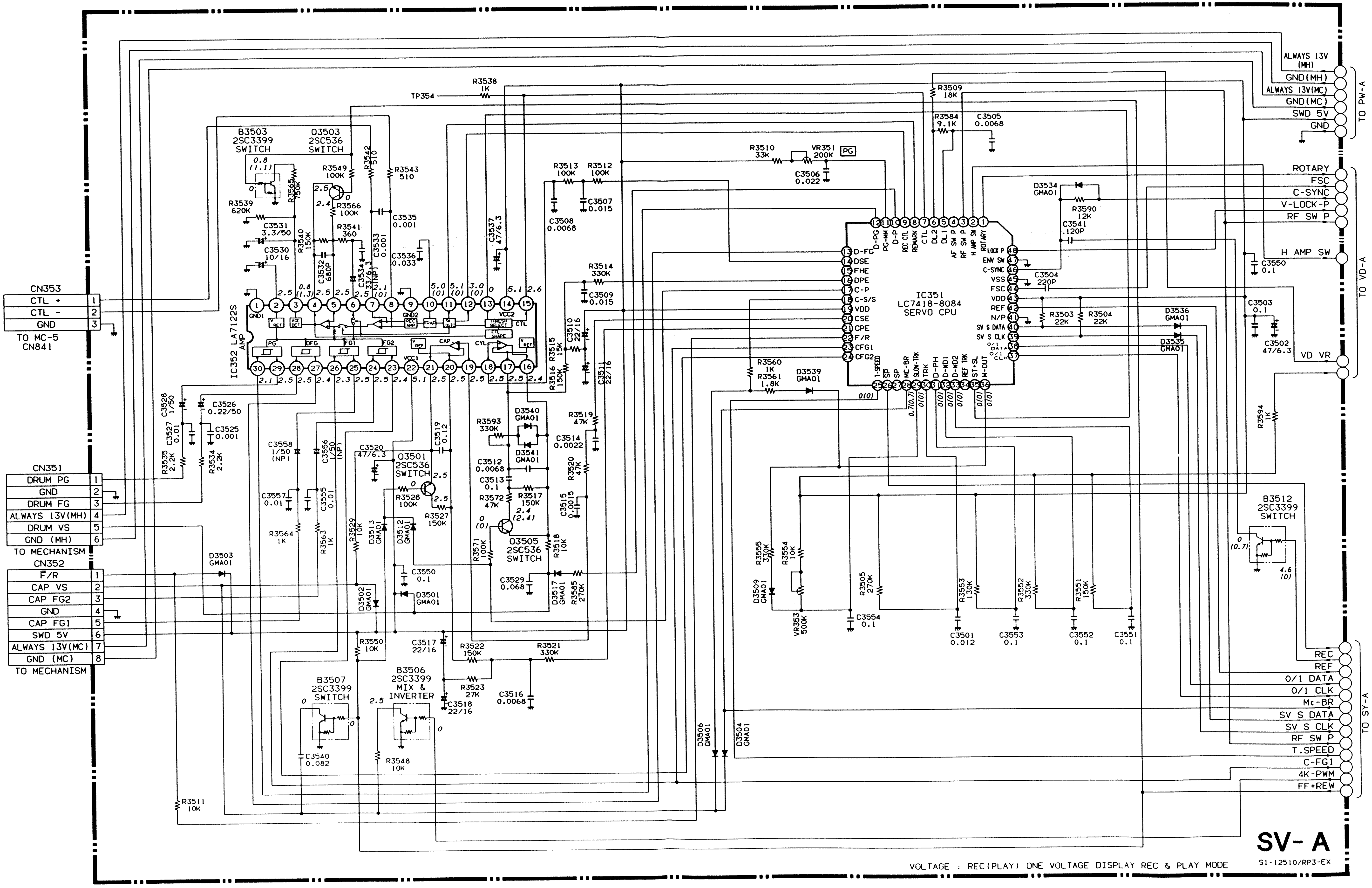


(X2+STILL) MODE OUT
SLOW/STILL
REF-TRK
D-WD2
D-WD1
D-PH
TRK-CR
SLOW-TRK-CR
MC-BR
SP
SP
EP/LP/SP (LP/SP ..PAL)
INDEX-CLK
INDEX-DATA
SV-S-CLK
SV-S-DATA
NTSC/PAL
REF
VDD
FSC IN
VSS
C-SYNC
ENV SW
VD
SLOW DRUM JITTER CONTROL
D-P
NORMAL TRK
SLOW TRK
TAPE SPEED DETECTOR
CTL
FG1
CTL-DUTY DETECT
DIGITAL TRACKING
TRK
TRK DATA
NORMAL
SLOW
CTL
MODE CONTROL
IC CONTROL
REF-D
P.B
EDIT
REF.
REC
CLK
CAPSTAN REF-GENERATOR
REC
P.B
FG30/25 DIVIDER
FG1
CTL
S-PB DIVIDER
CTL
S-PB DIVIDER
CAPSTAN PHASE CONTROL
CPE
CAPSTAN SPEED CONTROL
CSE
FG1
FG2
MC-BR
SLOW/STILL INTERMITTENT-DRIVE CONTROL (F.ADV)
REF CLK
CLOCK GENERATOR
REF.DELAY
REF.
REF.
CLK
REF.GENERATOR
RF-SW-P
SYNC SEPAPATER
V.
H.
F/R
P.B
REC
CLK
DRUM-PHASE CONTROL
DPE
DRUM-SPEED CONTROL
D-FG
DSE
4-HEAD-SW
2H-DELAY AF-DELAY
VD GENERATOR
REC-CTL
D-PG DL
D-P
C-FG2
C-FG1
F/R
CPE
CSE
VDD
C-STRT /STP
CAP-P
DPE
FHE
DSE
D-FG
ROTARY
H-AMP-SW
RF-SW -PULSE
AF-SW -PULSE
DL1
DL2
CTL IN
REMARK
REC-CTL
D-P
D-PG.MM
D-PG
BDS:-LC7418

2-16. CP-1 BOARD (SV-A) SERVO CIRCUIT DIAGRAM


CN353
CTL +
CTL -
GND
TO MC-5 CN841
CN351
DRUM PG
GND
DRUM FG
ALWAYS 13V(MH)
DRUM VS
GND (MH)
TO MECHANISM
CN352
F/R
CAP VS
CAP FG2
GND
CAP FG1
SWD 5V
ALWAYS 13V(MC)
GND (MC)
TO MECHANISM
IC352 LA7122S AMP
B3503 2SC3399 SWITCH
Q3503 2SC536 SWITCH
Q3501 2SC536 SWITCH
Q3505 2SC536 SWITCH
B3507 2SC3399 SWITCH
B3506 2SC3399 MIX & INVERTER
B3512 2SC3399 SWITCH
IC351 LC7418-8084 SERVO CPU
TP354
R3538 1K
R3509 18K
R3584 9.1K
C3505 0.0068
R3510 33K
VR351 200K PG
C3506 0.022
R3513 100K
R3512 100K
C3507 0.015
C3508 0.0068
R3514 330K
C3509 0.015
D3534 GMA01
R3590 12K
C3541 120P
C3504 220P
R3503 22K
R3504 22K
D3536 GMA01
D3535 GMA01
C3550 0.1
C3503 0.1
C3502 47/6.3
R3594 1K
R3560 1K
R3561 1.8K
D3539 GMA01
R3555 330K
R3554 10K
VR353 500K
D3509 GMA01
R3505 270K
C3554 0.1
R3553 130K
C3501 0.012
R3552 330K
C3553 0.1
R3551 150K
C3552 0.1
C3551 0.1
D3506 GMA01
D3504 GMA01
R3549 100K
R3542 510
R3543 510
R3539 620K
R3565 750K
R3566 100K
R3541 360
C3535 0.001
C3531 3.3/50
C3530 10/16
R3540 150K
C3532 680P
C3534 33/6.3 (NP)
C3533 0.001
C3536 0.033
C3537 47/6.3
R3515 15K
R3516 150K
C3510 22/16
C3511 22/16
C3528 1/50
C3526 0.22/50
C3525 0.001
C3527 0.01
R3535 2.2K
R3534 2.2K
C3558 1/50 (NP)
C3556 1/50 (NP)
C3520 47/6.3
C3519 0.12
C3557 0.01
C3555 0.01
R3564 1K
R3563 1K
R3529 10K
D3513 GMA01
D3512 GMA01
R3528 100K
R3527 150K
R3593 330K
D3540 GMA01
D3541 GMA01
C3514 0.0022
R3519 47K
C3512 0.0068
C3513 0.1
R3572 47K
R3517 150K
R3520 47K
C3515 0.0015
R3571 100K
R3518 10K
C3529 0.068
D3517 GMA01
R3585 270K
D3503 GMA01
D3502 GMA01
C3550 0.1
D3501 GMA01
R3550 10K
C3517 22/16
R3522 150K
R3521 330K
R3523 27K
C3518 22/16
C3516 0.0068
C3540 0.082
R3548 10K
R3511 10K
ALWAYS 13V (MH)
GND(MH)
ALWAYS 13V(MC)
GND(MC)
SWD 5V
GND
TO PW-A
ROTARY
FSC
C-SYNC
V-LOCK-P
RF SW P
H AMP SW
VD VR
TO VD-A
REC
REF
O/1 DATA
O/1 CLK
Mc-BR
SV S DATA
SV S CLK
RF SW P
T.SPEED
C-FG1
4K-PWM
FF+REW
TO SY-A
SV- A
VOLTAGE : REC(PLAY) ONE VOLTAGE DISPLAY REC & PLAY MODE
S1-12510/RP3-EX
A B C D E F G H I J K
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

2-16. CP-1 BOARD (SV-A) SERVO CIRCUIT DIAGRAM



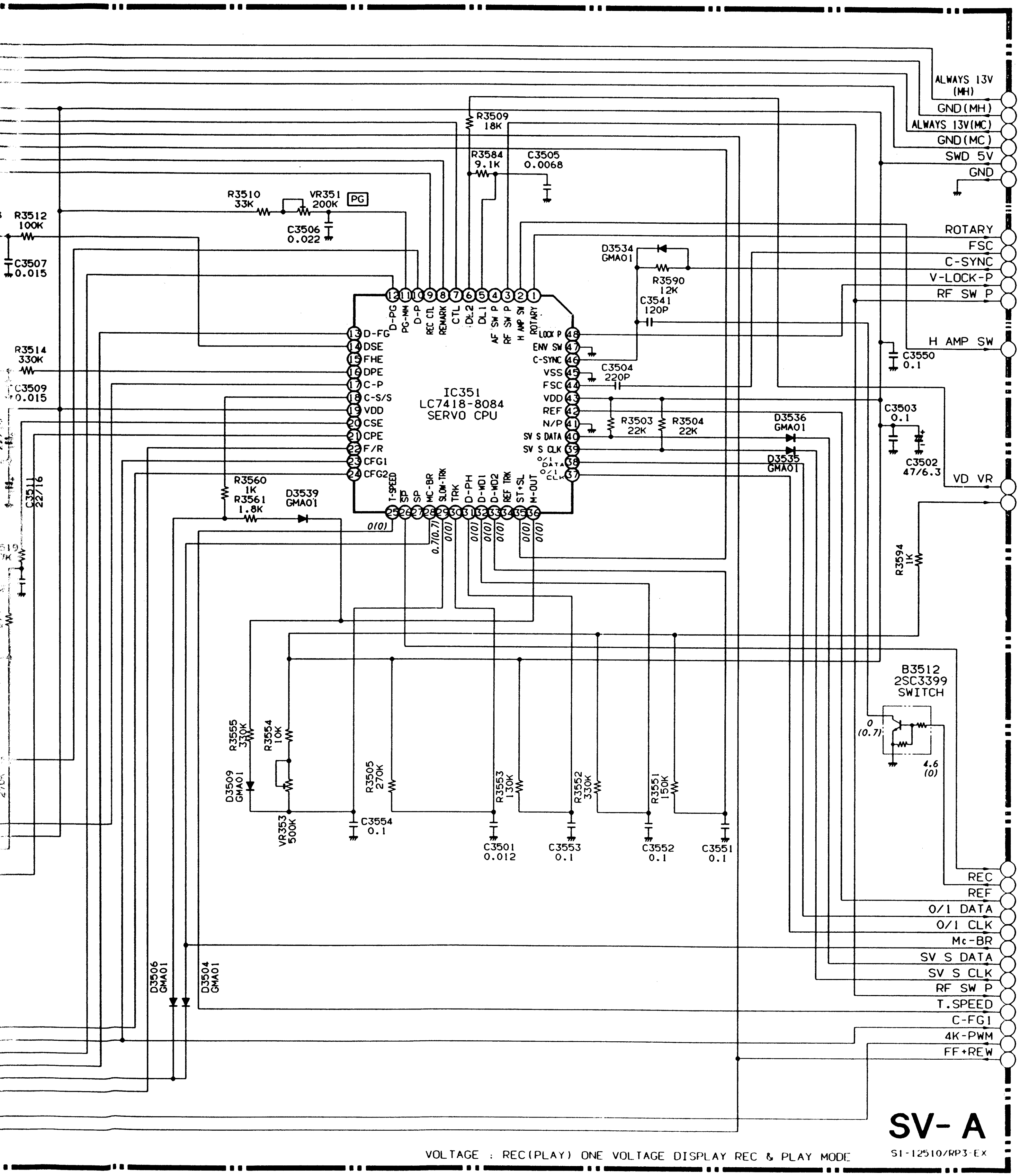
CN353
CTL +
CTL -
GND
TO MC-5
CN841
CN351
DRUM PG
GND
DRUM FG
ALWAYS 13V(MH)
DRUM VS
GND (MH)
TO MECHANISM
CN352
F/R
CAP VS
CAP FG2
GND
CAP FG1
SWD 5V
ALWAYS 13V(MC)
GND (MC)
TO MECHANISM
IC352 LA7122S AMP
IC351
LC7418-8084
SERVO CPU
B3503
2SC3399
SWITCH
Q3503
2SC536
SWITCH
Q3501
2SC536
SWITCH
Q3505
2SC536
SWITCH
B3507
2SC3399
SWITCH
B3506
2SC3399
MIX &
INVERTER
B3512
2SC3399
SWITCH
TP354
R3538
1K
R3509
18K
R3584
9.1K
C3505
0.0068
R3510
33K
VR351
200K
PG
C3506
0.022
R3513
100K
R3512
100K
C3507
0.015
C3508
0.0068
R3514
330K
C3509
0.015
D3534
GMA01
R3590
12K
C3541
120P
C3504
220P
C3550
0.1
C3503
0.1
C3502
47/6.3
R3503
22K
R3504
22K
D3536
GMA01
D3535
GMA01
R3560
1K
R3561
1.8K
D3539
GMA01
R3594
1K
ALWAYS 13V (MH)
GND(MH)
ALWAYS 13V(MC)
GND(MC)
SWD 5V
GND
TO PW-A
ROTARY
FSC
C-SYNC
V-LOCK-P
RF SW P
H AMP SW
VD VR
TO VD-A
REC
REF
0/1 DATA
0/1 CLK
Mc-BR
SV S DATA
SV S CLK
RF SW P
T.SPEED
C-FG1
4K-PWM
FF+REW
TO SY-A
R3555
330K
R3554
10K
D3509
GMA01
VR353
500K
C3554
0.1
R3505
270K
R3553
130K
C3501
0.012
R3552
330K
C3553
0.1
R3551
150K
C3552
0.1
C3551
0.1
D3506
GMA01
D3504
GMA01
R3549
100K
R3542
510
R3543
510
R3566
100K
R3539
620K
R3565
750K
C3531
3.3/50
C3530
10/16
R3540
150K
R3541
360
C3535
0.001
C3533
0.001
C3532
680P
C3534
33/6.3
C3536
0.033
C3537
47/6.3
C3510
22/16
R3515
15K
R3516
150K
C3511
22/16
R3519
47K
C3514
0.0022
R3520
47K
C3515
0.0015
R3518
10K
D3540
GMA01
D3541
GMA01
R3593
330K
C3512
0.0068
C3513
0.1
R3572
47K
R3517
150K
R3571
100K
C3529
0.068
D3517
GMA01
R3585
270K
C3528
1/50
C3526
0.22/50
C3527
0.01
C3525
0.001
R3535
2.2K
R3534
2.2K
C3558
1/50
(NP)
C3556
1/50
(NP)
C3520
47/6.3
C3519
0.12
R3528
100K
R3527
150K
C3557
0.01
C3555
0.01
R3564
1K
R3563
1K
R3529
10K
D3513
GMA01
D3512
GMA01
C3550
0.1
D3501
GMA01
D3502
GMA01
D3503
GMA01
R3550
10K
C3517
22/16
R3522
150K
R3521
330K
R3523
27K
C3518
22/16
C3516
0.0068
C3540
0.082
R3548
10K
R3511
10K

VOLTAGE : REC(PLAY) ONE VOLTAGE DISPLAY REC & PLAY MODE

SV-A

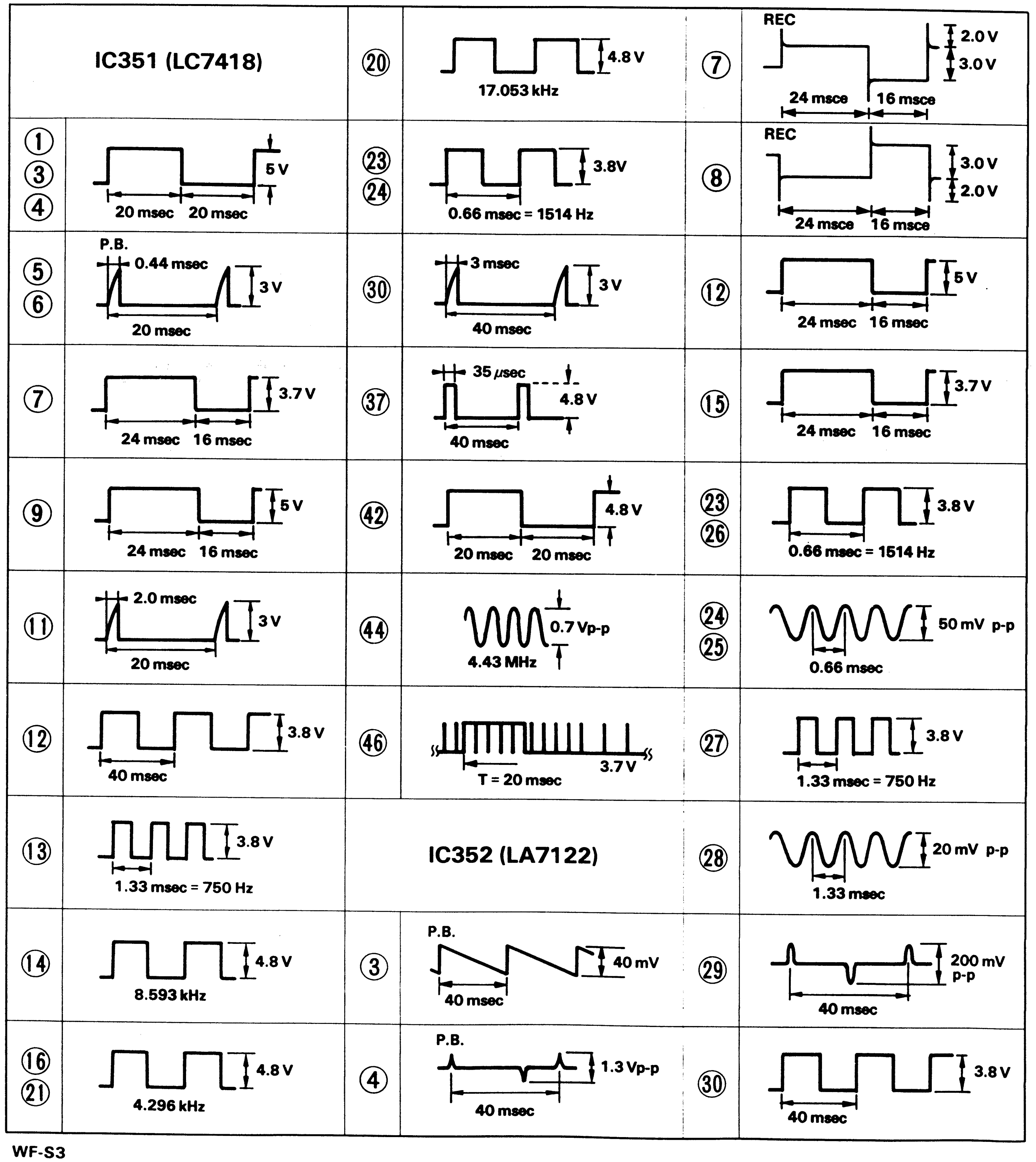
SI-12510/RP3-EX

ARD (SV-A) SERVO CIRCUIT DIAGRAM



IC351
LC7418-8084
SERVO CPU
D-PG
PG-MH
D-P
REC CTL
REMARK
CTL
DL2
DL1
AF SW P
RF SW P
H AMP SW
ROTARY
LOCK P
ENV SW
C-SYNC
VSS
FSC
VDD
REF
N/P
SV S DATA
SV S CLK
0/1 DATA
0/1 CLK
D-FG
DSE
FHE
DPE
C-P
C-S/S
VDD
CSE
CPE
F/R
CFG1
CFG2
T-SPEED
STB
SP
MC-BR
SLOW-TRK
TRK
D-PH
D-WD1
D-WD2
REF TRK
ST+SL
M-OUT
R3509 18K
R3584 9.1K
C3505 0.0068
R3510 33K
VR351 200K
PG
C3506 0.022
R3512 100K
C3507 0.015
R3514 330K
C3509 0.015
C3511 22/16
D3534 GMA01
R3590 12K
C3541 120P
C3504 220P
R3503 22K
R3504 22K
D3536 GMA01
D3535 GMA01
C3550 0.1
C3503 0.1
C3502 47/6.3
R3560 1K
R3561 1.8K
D3539 GMA01
R3594 1K
B3512
2SC3399
SWITCH
R3555 330K
R3554 10K
D3509 GMA01
VR353 500K
R3505 270K
C3554 0.1
R3553 130K
C3501 0.012
R3552 330K
C3553 0.1
R3551 150K
C3552 0.1
C3551 0.1
D3506 GMA01
D3504 GMA01
ALWAYS 13V (MH)
GND (MH)
ALWAYS 13V(MC)
GND (MC)
SWD 5V
GND
TO PW-A
ROTARY
FSC
C-SYNC
V-LOCK-P
RF SW P
H AMP SW
VD VR
TO VD-A
REC
REF
0/1 DATA
0/1 CLK
Mc-BR
SV S DATA
SV S CLK
RF SW P
T.SPEED
C-FG1
4K-PWM
FF•REW
TO SY-A
SV- A
VOLTAGE : REC(PLAY) ONE VOLTAGE DISPLAY REC & PLAY MODE
S1-12510/RP3-EX

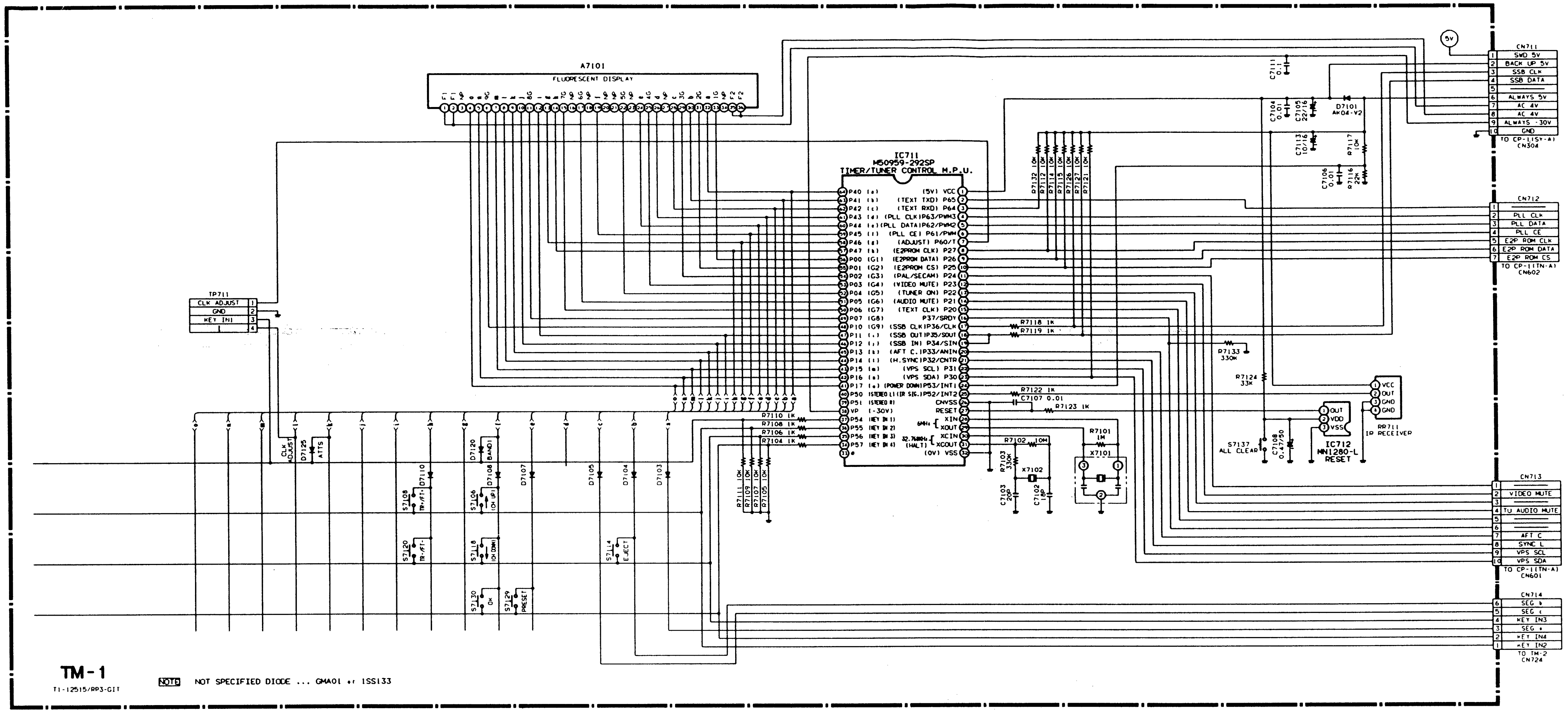
2-17. WAVEFORM OF SERVO



IC351 (LC7418)
① ③ ④ 20 msec 20 msec 5V
P.B. ⑤ ⑥ 0.44 msec 20 msec 3V
⑦ 24 msec 16 msec 3.7V
⑨ 24 msec 16 msec 5V
⑪ 2.0 msec 20 msec 3V
⑫ 40 msec 3.8V
⑬ 1.33 msec = 750 Hz 3.8V
⑭ 8.593 kHz 4.8V
⑯ ㉑ 4.296 kHz 4.8V
⑳ 17.053 kHz 4.8V
㉓ ㉔ 0.66 msec = 1514 Hz 3.8V
㉚ 3 msec 40 msec 3V
㊲ 35 μsec 40 msec 4.8V
㊷ 20 msec 20 msec 4.8V
㊹ 4.43 MHz 0.7 Vp-p
㊻ T = 20 msec 3.7V
IC352 (LA7122)
P.B. ③ 40 msec 40 mV
P.B. ④ 40 msec 1.3 Vp-p
REC ⑦ 24 msce 16 msce 2.0V 3.0V
REC ⑧ 24 msce 16 msce 3.0V 2.0V
⑫ 24 msec 16 msec 5V
⑮ 24 msec 16 msec 3.7V
㉓ ㉖ 0.66 msec = 1514 Hz 3.8V
㉔ ㉕ 0.66 msec 50 mV p-p
㉗ 1.33 msec = 750 Hz 3.8V
㉘ 1.33 msec 20 mV p-p
㉙ 40 msec 200 mV p-p
㉚ 40 msec 3.8V

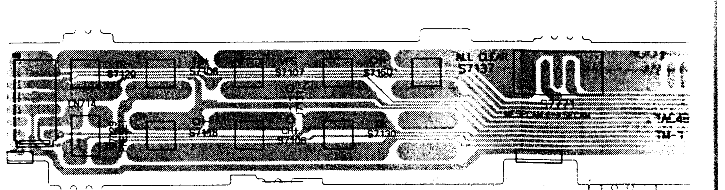
WF-S3

2-18. TM-1, 2 BOARD DISPLAY, TIMER, TUNING CONTROL & SWITCH CIRCUIT DIAGRAM



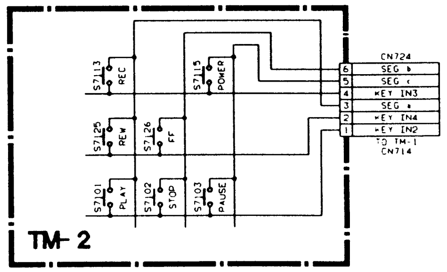
A7101
FLUORESCENT DISPLAY
IC711
M50959-292SP
TIMER/TUNER CONTROL M.P.U.
P40 (a) 64
P41 (b) 63
P42 (c) 62
P43 (d) 61
P44 (e) 60
P45 (f) 59
P46 (g) 58
P47 (h) 57
P00 (G1) 56
P01 (G2) 55
P02 (G3) 54
P03 (G4) 53
P04 (G5) 52
P05 (G6) 51
P06 (G7) 50
P07 (G8) 49
P10 (G9) 48
P11 (i) 47
P12 (j) 46
P13 (k) 45
P14 (l) 44
P15 (m) 43
P16 (n) 42
P17 (o) 41
P50 (STEREO L) 40
P51 (STEREO R) 39
VP (-30V) 38
P54 (KEY IN 1) 37
P55 (KEY IN 2) 36
P56 (KEY IN 3) 35
P57 (KEY IN 4) 34
33
1 (5V) VCC
2 (TEXT TXD) P65
3 (TEXT RXD) P64
4 (PLL CLK) P63/PWM3
5 (PLL DATA) P62/PWM2
6 (PLL CE) P61/PWM
7 (ADJUST) P60/T
8 (E2PROM CLK) P27
9 (E2PROM DATA) P26
10 (E2PROM CS) P25
11 (PAL/SECAM) P24
12 (VIDEO MUTE) P23
13 (TUNER ON) P22
14 (AUDIO MUTE) P21
15 (TEXT CLK) P20
16 P37/SRDY
17 (SSB CLK) P36/CLK
18 (SSB OUT) P35/SOUT
19 (SSB IN) P34/SIN
20 (AFT C.) P33/ANIN
21 (H.SYNC) P32/CNTR
22 (VPS SCL) P31
23 (VPS SDA) P30
24 (POWER DOWN) P53/INT1
25 (IR SIG.) P52/INT2
26 CNVSS
27 RESET
28 XIN
29 XOUT
6MHz
30 XCIN
31 XCOUT
32.768kHz (HALT)
32 (0V) VSS
5V
CN711
1 SWD 5V
2 BACK UP 5V
3 SSB CLK
4 SSB DATA
5
6 ALWAYS 5V
7 AC 4V
8 AC 4V
9 ALWAYS -30V
10 GND
TO CP-1(SY-A) CN304
CN712
1
2 PLL CLK
3 PLL DATA
4 PLL CE
5 E2P ROM CLK
6 E2P ROM DATA
7 E2P ROM CS
TO CP-1(TN-A) CN602
CN713
1
2 VIDEO MUTE
3
4 TU AUDIO MUTE
5
6
7 AFT C
8 SYNC L
9 VPS SCL
10 VPS SDA
TO CP-1(TN-A) CN601
CN714
6 SEG b
5 SEG c
4 KEY IN3
3 SEG a
2 KEY IN4
1 KEY IN2
TO TM-2 CN724
TP711
1 CLK ADJUST
2 GND
3 KEY IN1
4
C7111 0.1
C7104 0.01
C7105 22/16
D7101 AH04-V2
C7113 10/16
R7117 10K
C7106 0.01
R7116 22K
R7118 1K
R7119 1K
R7133 330K
R7124 33K
R7122 1K
C7107 0.01
R7123 1K
R7101 1M
X7101
R7102 10M
R7103 330K
X7102
C7103 20P
C7102 18P
S7137 ALL CLEAR
C7108 0.47/50
IC712 MN1280-L RESET
OUT
VDD
VSS
VCC
OUT
GND
GND
RR711 IR RECEIVER
R7110 1K
R7108 1K
R7106 1K
R7104 1K
R7111 10K
R7109 10K
R7107 10K
R7105 10K
CLK ADJUST
D7125
ATT5
D7110
S7108 TR-AFT+
S7120 TR-AFT-
D7120 BAND
D7108
S7106 CH UP
S7118 CH DOWN
S7130 CH
S7129 PRESET
D7107
D7105
D7104
S7114 EJECT
D7103
TM-1
1-12515/RP3-G1T

NOTE NOT SPECIFIED DIODE ... GMA01 or 1SS133

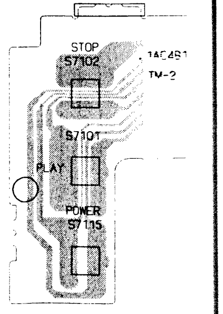


S7120
S7108
S7107
S7106
ALL CLEAR
S7137
TM-1

2-



CN724
6 SEG b
5 SEG c
4 KEY IN3
3 SEG a
2 KEY IN4
1 KEY IN2
TO TM-1 CN714
S7113 REC
S7115 POWER
S7125 REW
S7126 FF
S7101 PLAY
S7102 STOP
S7103 PAUSE
TM-2

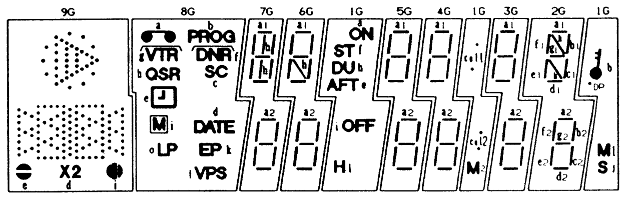


STOP
S7102
TM-2
S7101
PLAY
POWER
S7115

ANODE CONNECTION

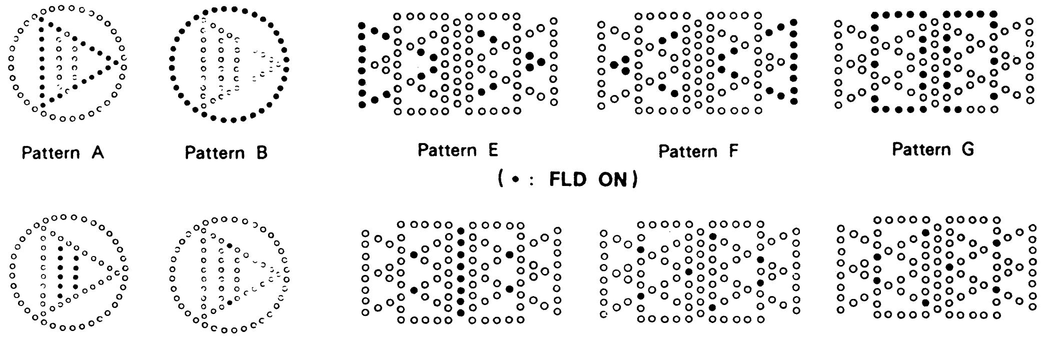
	9G	8G	7G	6G	5G	4G	3G	2G	1G
a	B	●●	a1	a1	a1	a1	a1	a1	ON
b	A	PROG.	b1	b1	b1	b1	b1	b1	●
c	-	SC	c1	c1	c1	c1	c1	c1	DP
d	×2	DATE	d1	d1	d1	d1	d1	d1	M(1)
e	⊖	▣	e1	e1	e1	e1	e1	e1	AFT
f	C	DNR	f1	f1	f1	f1	f1	f1	ST
g	D	VTR	g1	g1	g1	g1	g1	g1	col'1
h	-	OSR	/	\	-	-	-	\	DU
i	●	[M]	a2	a2	a2	a2	a2	a2	OFF
j	E	-	b2	b2	b2	b2	b2	b2	S
k	I	EP	c2	c2	c2	c2	c2	c2	-
l	H	VPS	d2	d2	d2	d2	d2	d2	H
m	J	-	e2	e2	e2	e2	e2	e2	M(2)
n	F	-	f2	f2	f2	f2	f2	f2	-
o	G	LP	g2	g2	g2	g2	g2	g2	col'2

GRID ASSIGNMENT



9G
8G
7G
6G
5G
4G
1G
3G
2G
1G
X2
VTR
PROG
DNR
QSR
SC
DATE
LP
EP
VPS
ON
ST
DU
AFT
OFF
H
M
M
S

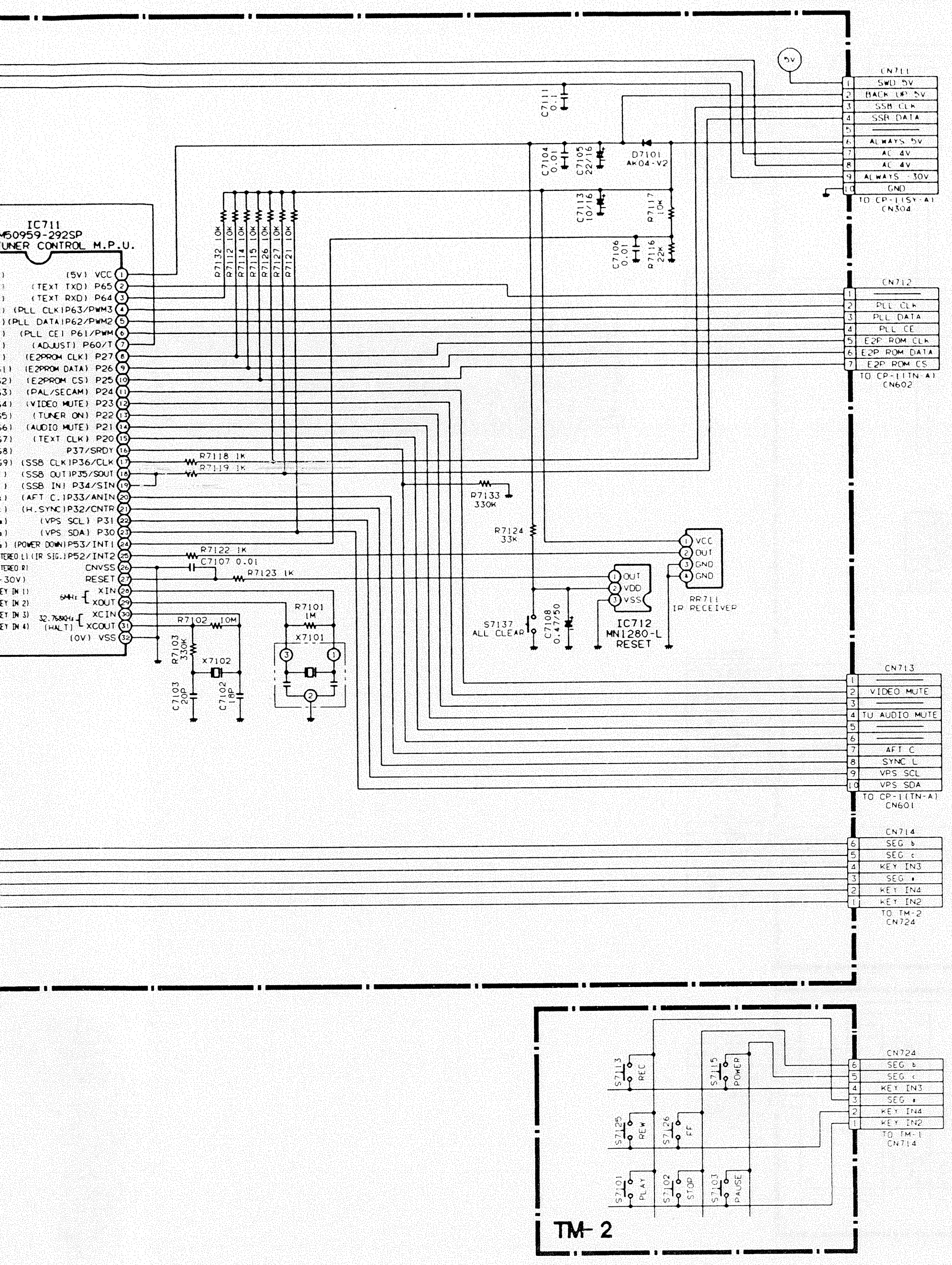
9G: GRAPHIC MODE DISPLAY



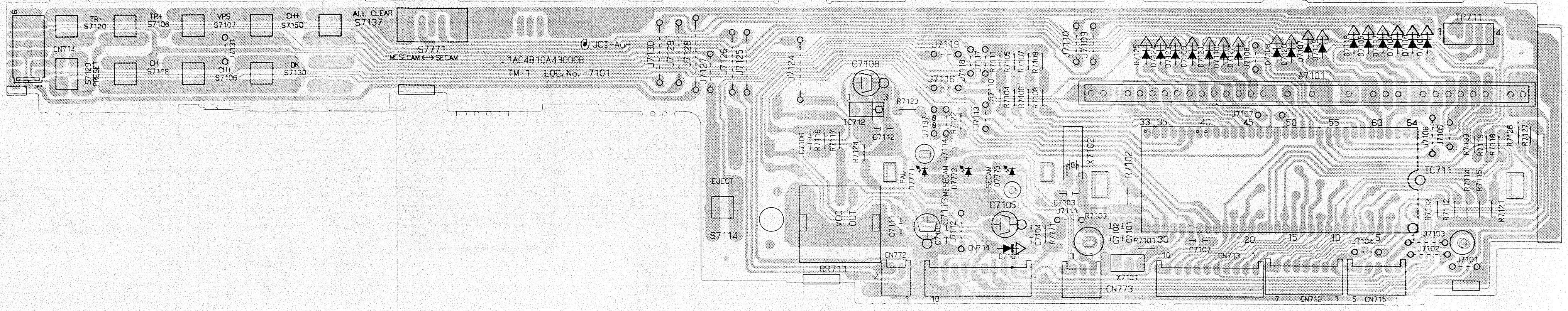
Pattern A
Pattern B
Pattern E
Pattern F
Pattern G
Pattern C
Pattern D
Pattern H
Pattern I
Pattern J

(• : FLD ON)

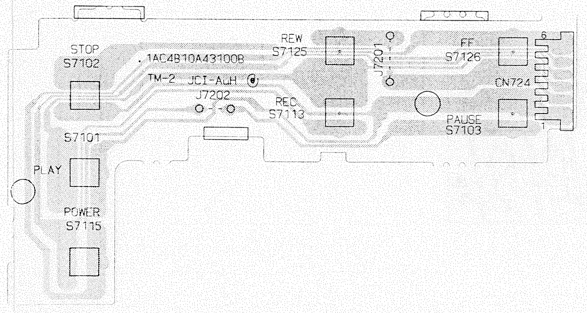
G CONTROL & SWITCH


IC711
M50959-292SP
TUNER CONTROL M.P.U.
(5V) VCC 1
(TEXT TXD) P65 2
(TEXT RXD) P64 3
(PLL CLK)P63/PWM3 4
(PLL DATA)P62/PWM2 5
(PLL CE) P61/PWM 6
(ADJUST) P60/T 7
(E2PROM CLK) P27 8
(E2PROM DATA) P26 9
(E2PROM CS) P25 10
(PAL/SECAM) P24 11
(VIDEO MUTE) P23 12
(TUNER ON) P22 13
(AUDIO MUTE) P21 14
(TEXT CLK) P20 15
P37/SRDY 16
(SSB CLK)P36/CLK 17
(SSB OUT)P35/SOUT 18
(SSB IN) P34/SIN 19
(AFT C.)P33/ANIN 20
(H.SYNC)P32/CNTR 21
(VPS SCL) P31 22
(VPS SDA) P30 23
(POWER DOWN)P53/INT1 24
(IR SIG.)P52/INT2 25
CNVSS 26
RESET 27
6MHz XIN 28
XOUT 29
32.768KHz (HALT) XCIN 30
XCOUT 31
(0V) VSS 32
R7132 10K
R7112 10K
R7114 10K
R7115 10K
R7126 10K
R7127 10K
R7121 10K
R7118 1K
R7119 1K
R7122 1K
C7107 0.01
R7123 1K
R7101 1M
X7101
R7102 10M
R7103 330K
X7102
C7103 20P
C7102 18P
R7133 330K
R7124 33K
S7137 ALL CLEAR
C7108 0.1/50
IC712 MN1280-L RESET
OUT VDD VSS
VCC OUT GND GND
RR711 IR RECEIVER
C7111
C7104 0.01
C7105 22/16
C7113 22/16
C7106 0.01
D7101 AK04-V2
R7117 10K
R7116 22K
5V
CN711
1 SWD 5V
2 BACK UP 5V
3 SSB CLK
4 SSB DATA
5
6 ALWAYS 5V
7 AC 4V
8 AC 4V
9 ALWAYS -30V
10 GND
TO CP-1(SY-A) CN304
CN712
1
2 PLL CLK
3 PLL DATA
4 PLL CE
5 E2P ROM CLK
6 E2P ROM DATA
7 E2P ROM CS
TO CP-1(TN-A) CN602
CN713
1
2 VIDEO MUTE
3
4 TU AUDIO MUTE
5
6
7 AFT C
8 SYNC L
9 VPS SCL
10 VPS SDA
TO CP-1(TN-A) CN601
CN714
6 SEG b
5 SEG c
4 KEY IN3
3 SEG a
2 KEY IN4
1 KEY IN2
TO TM-2 CN724
S7113 REC
S7115 POWER
S7125 REW
S7126 FF
S7101 PLAY
S7102 STOP
S7103 PAUSE
CN724
6 SEG b
5 SEG c
4 KEY IN3
3 SEG a
2 KEY IN4
1 KEY IN2
TO TM-1 CN714
TM-2

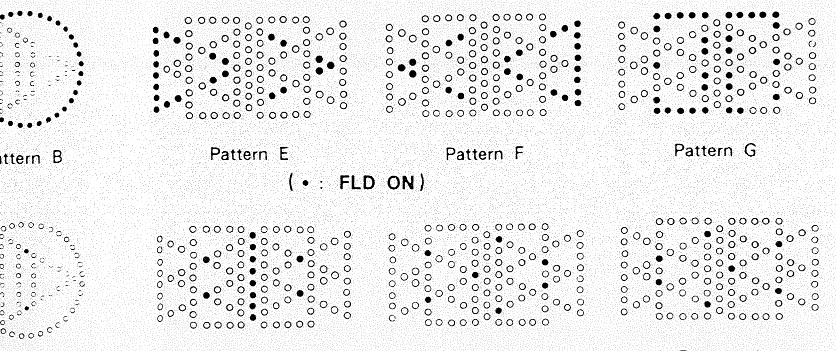
2-19. TM-1 CIRCUIT BOARD


TR- S7120
TR+ S7108
VPS S7107
CH+ S7150
ALL CLEAR S7137
CH- S7118
S7109
OK S7130
S7771
CN714
1AC4B10A43000B
TM-1 LOC. No. 7101
JCI-ACH
C7108
IC712
C7105
EJECT
S7114
RR711
CN771
CN772
CN773
CN712
CN713
CN715
IC711
X7101
X7102
TP711
A7101

2-20. TM-2 CIRCUIT BOARD


STOP S7102
1AC4B10A43100B
TM-2 JCI-ACH
J7202
REW S7125
J7201
FF S7126
CN724
REC S7113
S7101
PLAY
PAUSE S7103
POWER S7115

9G: GRAPHIC MODE DISPLAY


Pattern B

Pattern E

Pattern F

Pattern G

(• : FLD ON)

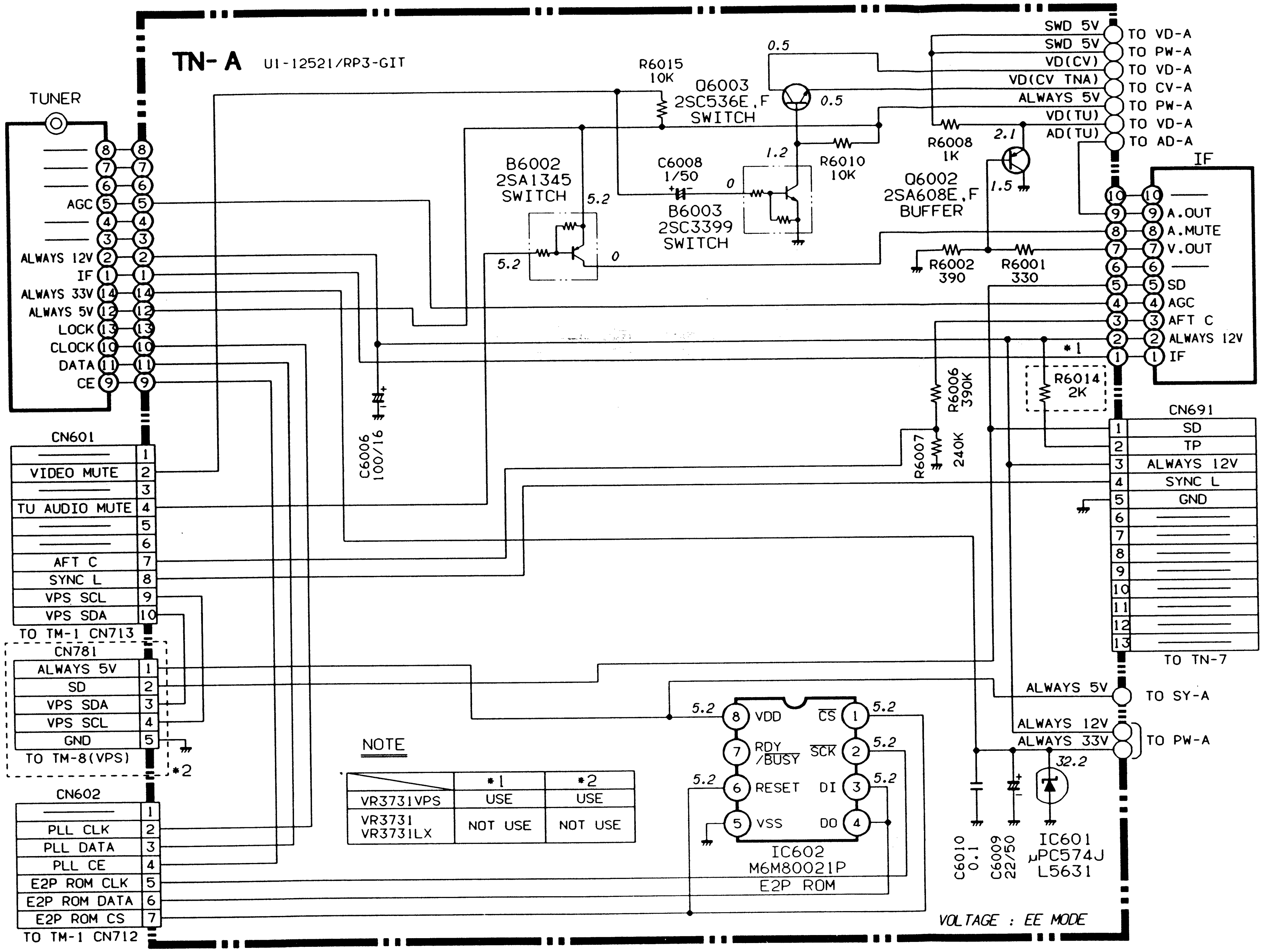
Pattern D

Pattern H

Pattern I

Pattern J

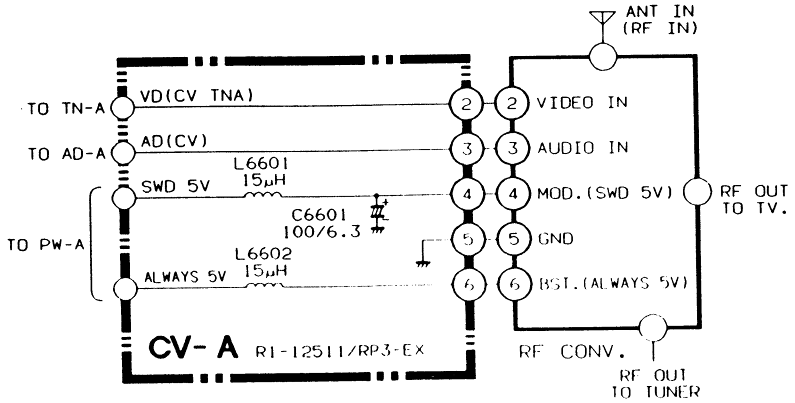
2-21. CP-1 BOARD (TN-A) TUNER IF CONNECTION CIRCUIT DIAGRAM


TN-A U1-12521/RP3-GIT
TUNER
AGC
ALWAYS 12V
IF
ALWAYS 33V
ALWAYS 5V
LOCK
CLOCK
DATA
CE
R6015 10K
Q6003 2SC536E,F SWITCH
B6002 2SA1345 SWITCH
C6008 1/50
B6003 2SC3399 SWITCH
R6010 10K
R6008 1K
Q6002 2SA608E,F BUFFER
R6002 390
R6001 330
SWD 5V
VD(CV)
VD(CV TNA)
ALWAYS 5V
VD(TU)
AD(TU)
TO VD-A
TO PW-A
TO CV-A
TO AD-A
IF
A.OUT
A.MUTE
V.OUT
SD
AGC
AFT C
ALWAYS 12V
*1
R6014 2K
R6006 390K
R6007 240K
C6006 100/16
CN601
VIDEO MUTE
TU AUDIO MUTE
AFT C
SYNC L
VPS SCL
VPS SDA
TO TM-1 CN713
CN781
ALWAYS 5V
SD
VPS SDA
VPS SCL
GND
TO TM-8(VPS)
*2
CN602
PLL CLK
PLL DATA
PLL CE
E2P ROM CLK
E2P ROM DATA
E2P ROM CS
TO TM-1 CN712
CN691
SD
TP
ALWAYS 12V
SYNC L
GND
TO TN-7
ALWAYS 5V
TO SY-A
ALWAYS 12V
ALWAYS 33V
TO PW-A
VDD
CS
RDY /BUSY
SCK
RESET
DI
VSS
DO
IC602 M6M80021P E2P ROM
C6010 0.1
C6009 22/50
IC601 μPC574J L5631
VOLTAGE : EE MODE
0.5
1.2
5.2
2.1
1.5
32.2
NOTE

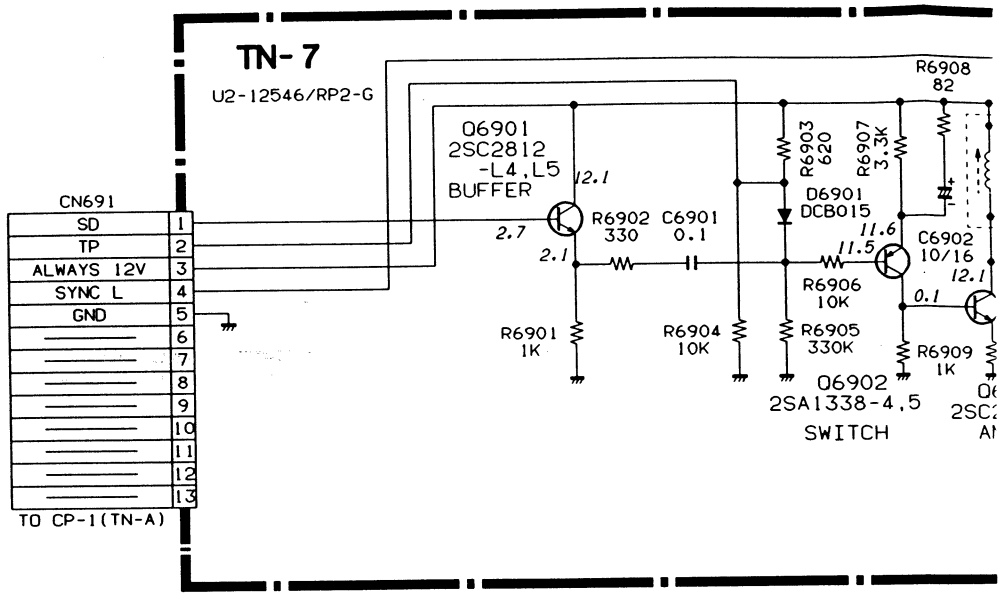
NOTE

	*1	*2
VR3731VPS	USE	USE
VR3731 VR3731LX	NOT USE	NOT USE

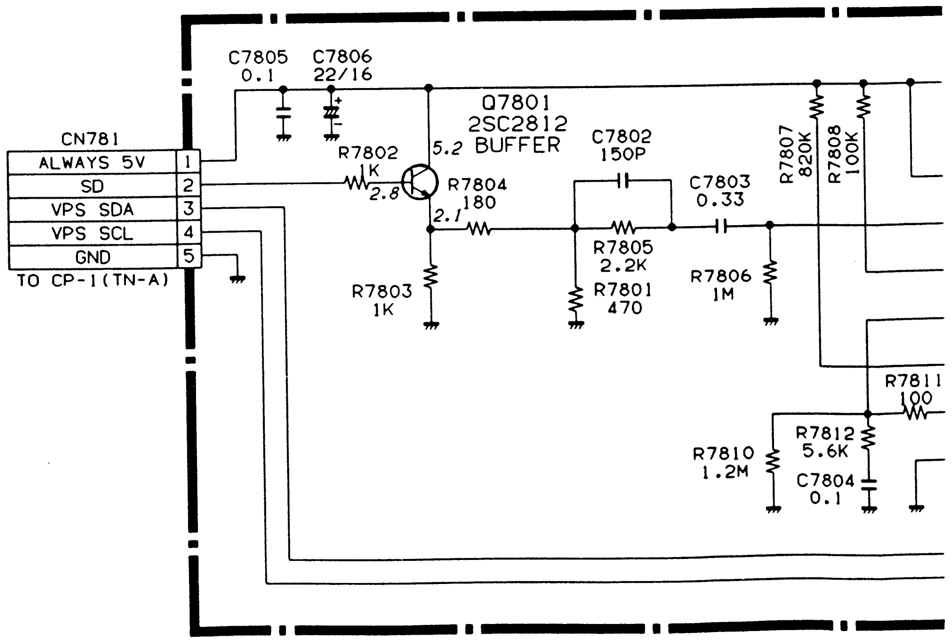
2-22. CP-1 BOARD (CV-A) RF CONVERTER CONNECTION CIRCUIT DIAGRAM


ANT IN (RF IN)
TO TN-A
VD(CV TNA)
TO AD-A
AD(CV)
TO PW-A
SWD 5V
L6601 15μH
C6601 100/6.3
L6602 15μH
ALWAYS 5V
VIDEO IN
AUDIO IN
MOD.(SWD 5V)
GND
BST.(ALWAYS 5V)
RF OUT TO TV.
RF CONV.
RF OUT TO TUNER
CV-A R1-12511/RP3-EX

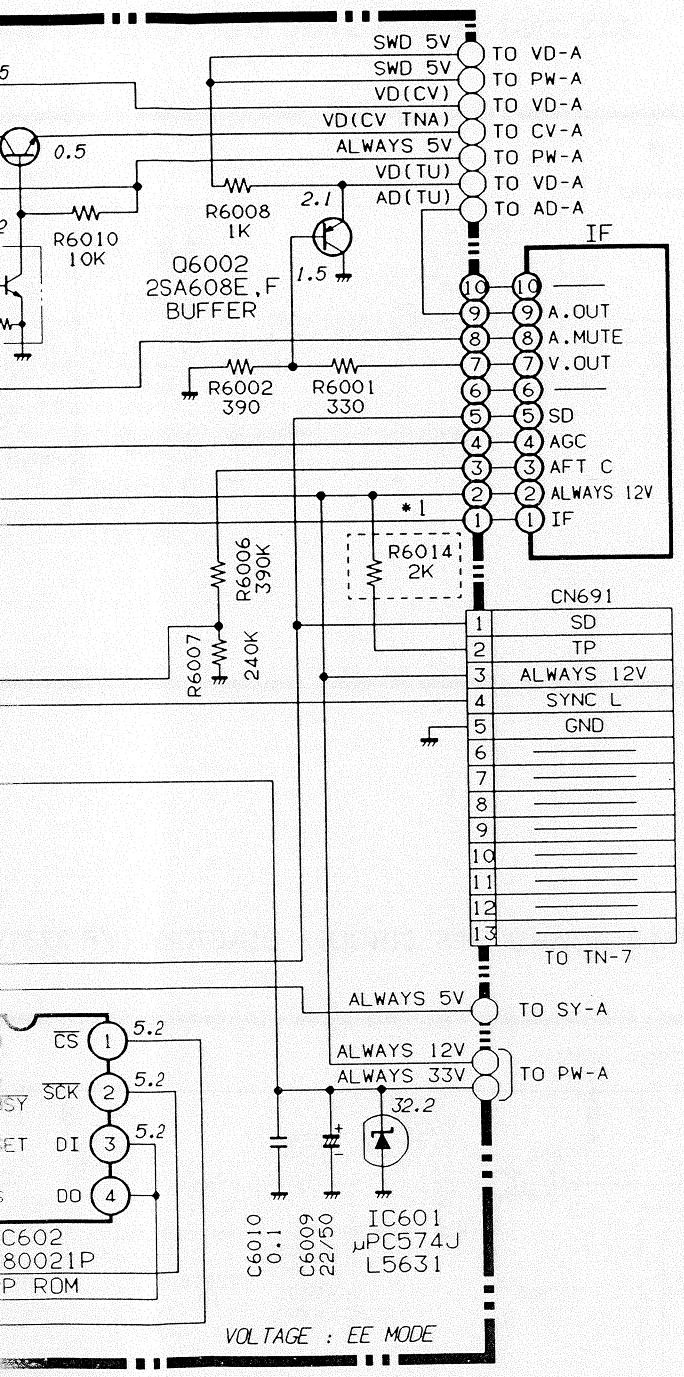
2-23. TN-7 BOARD SYNC DET. CIRCUIT DIAG


TN-7
U2-12546/RP2-G
CN691
SD
TP
ALWAYS 12V
SYNC L
GND
TO CP-1(TN-A)
Q6901 2SC2812 -L4,L5 BUFFER
R6902 330
C6901 0.1
R6901 1K
R6904 10K
R6903 620
R6907 3.3K
D6901 DCB015
R6905 330K
R6906 10K
C6902 10/16
R6908 82
R6909 1K
Q6902 2SA1338-4,5 SWITCH
12.1
2.7
2.1
11.6
11.5
0.1

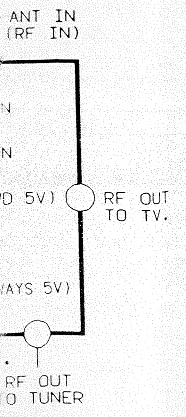
2-24. TM-8 BOARD VPS CIRCUIT DIAGRAM (VR 3731V


C7805 0.1
C7806 22/16
Q7801 2SC2812 BUFFER
CN781
ALWAYS 5V
SD
VPS SDA
VPS SCL
GND
TO CP-1(TN-A)
R7802 1K
R7804 180
C7802 150P
C7803 0.33
R7805 2.2K
R7801 470
R7803 1K
R7806 1M
R7807 820K
R7808 100K
R7811 100
R7810 1.2M
R7812 5.6K
C7804 0.1
5.2
2.8
2.1

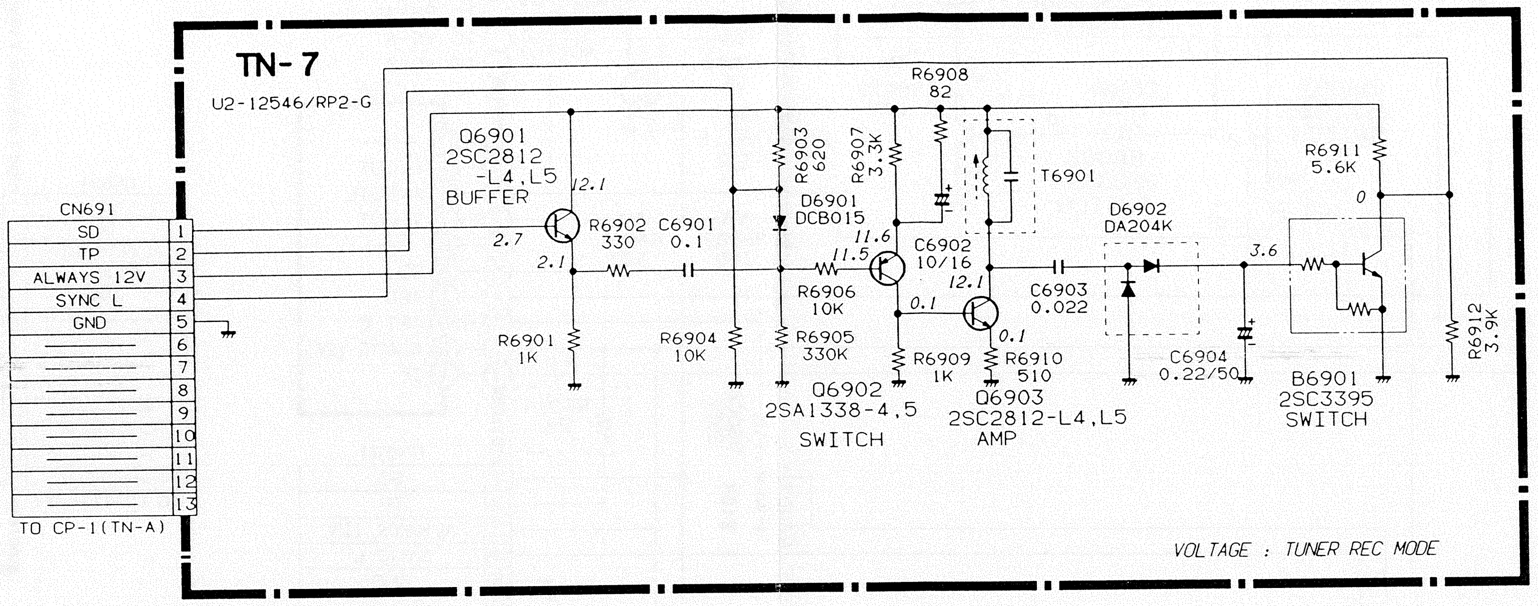
RCUIT DIAGRAM


SWD 5V
SWD 5V
VD(CV)
VD(CV TNA)
ALWAYS 5V
VD(TU)
AD(TU)
TO VD-A
TO PW-A
TO VD-A
TO CV-A
TO PW-A
TO VD-A
TO AD-A
0.5
R6010
10K
R6008
1K
2.1
1.5
Q6002
2SA608E,F
BUFFER
IF
A.OUT
A.MUTE
V.OUT
SD
AGC
AFT C
ALWAYS 12V
IF
R6002
390
R6001
330
*1
R6014
2K
R6006
390K
R6007
240K
CN691
SD
TP
ALWAYS 12V
SYNC L
GND
TO TN-7
ALWAYS 5V
TO SY-A
ALWAYS 12V
ALWAYS 33V
TO PW-A
CS
SCK
DI
DO
5.2
5.2
5.2
32.2
C602
80021P
P ROM
C6010
0.1
C6009
22/50
IC601
μPC574J
L5631
VOLTAGE : EE MODE

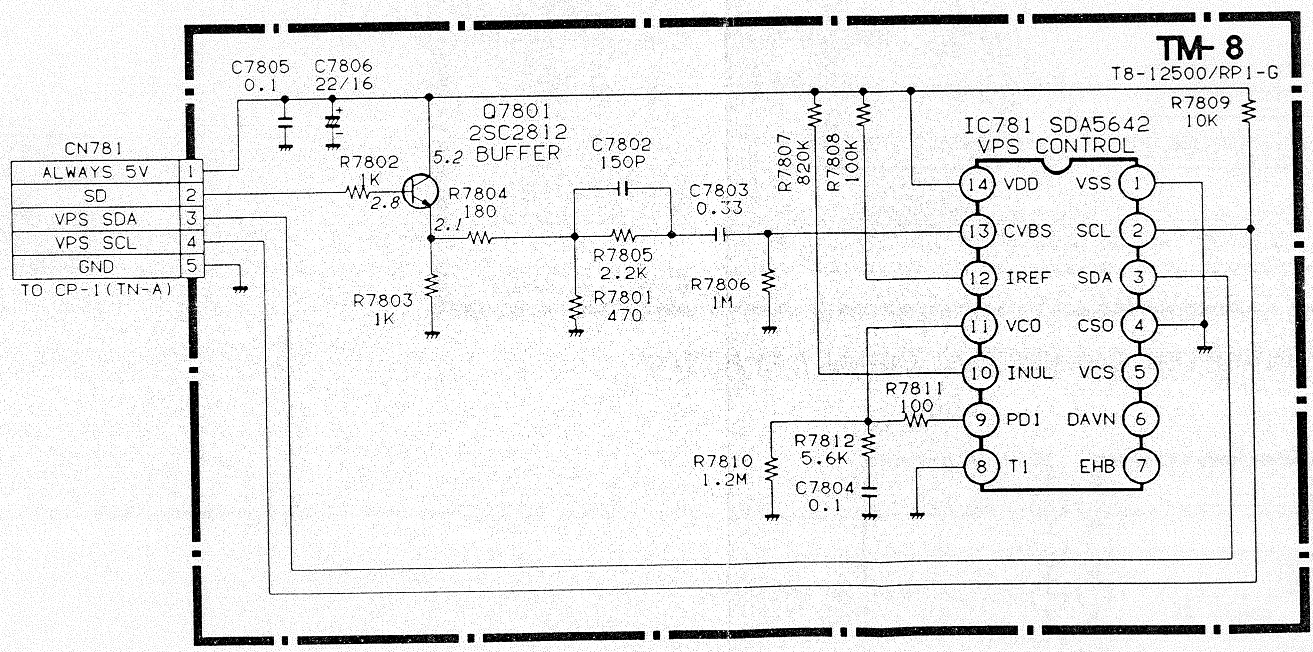
CIRCUIT DIAGRAM


ANT IN
(RF IN)
D 5V)
RF OUT
TO TV.
AYS 5V)
RF OUT
O TUNER

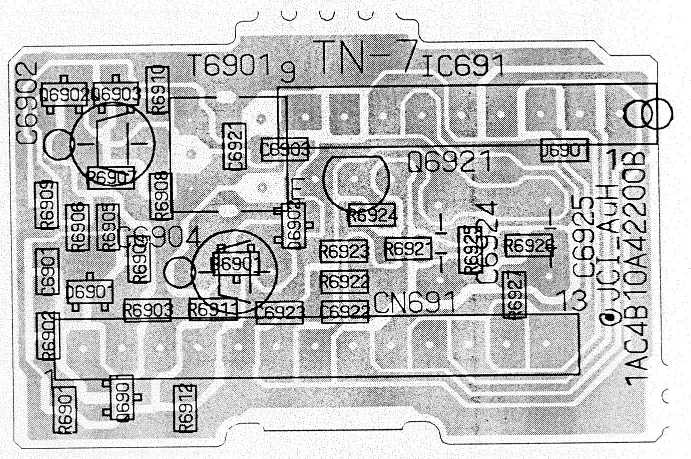
2-23. TN-7 BOARD SYNC DET. CIRCUIT DIAGRAM


TN-7
U2-12546/RP2-G
CN691
SD
TP
ALWAYS 12V
SYNC L
GND
TO CP-1(TN-A)
Q6901
2SC2812
-L4,L5
BUFFER
12.1
2.7
2.1
R6901
1K
R6902
330
C6901
0.1
R6903
620
R6904
10K
D6901
DCB015
R6907
3.3K
R6908
82
11.6
11.5
R6906
10K
R6905
330K
C6902
10/16
12.1
0.1
0.1
R6909
1K
R6910
510
Q6902
2SA1338-4,5
SWITCH
Q6903
2SC2812-L4,L5
AMP
T6901
C6903
0.022
D6902
DA204K
3.6
C6904
0.22/50
R6911
5.6K
0
B6901
2SC3395
SWITCH
R6912
3.9K
VOLTAGE : TUNER REC MODE

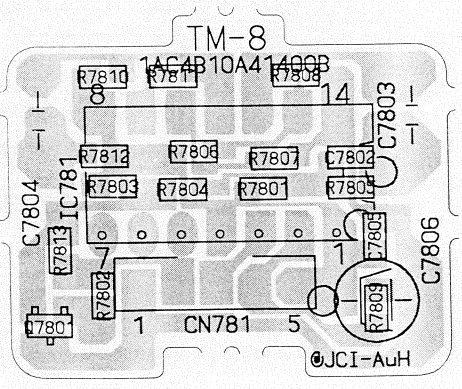
2-24. TM-8 BOARD VPS CIRCUIT DIAGRAM (VR 3731VPS ONLY)


TM-8
T8-12500/RP1-G
CN781
ALWAYS 5V
SD
VPS SDA
VPS SCL
GND
TO CP-1(TN-A)
C7805
0.1
C7806
22/16
R7802
1K
2.8
Q7801
2SC2812
5.2 BUFFER
R7804
180
2.1
R7803
1K
C7802
150P
R7805
2.2K
R7801
470
C7803
0.33
R7806
1M
R7807
820K
R7808
100K
IC781 SDA5642
VPS CONTROL
VDD
CVBS
IREF
VCO
INUL
PD1
T1
VSS
SCL
SDA
CSO
VCS
DAVN
EHB
R7809
10K
R7811
100
R7812
5.6K
R7810
1.2M
C7804
0.1

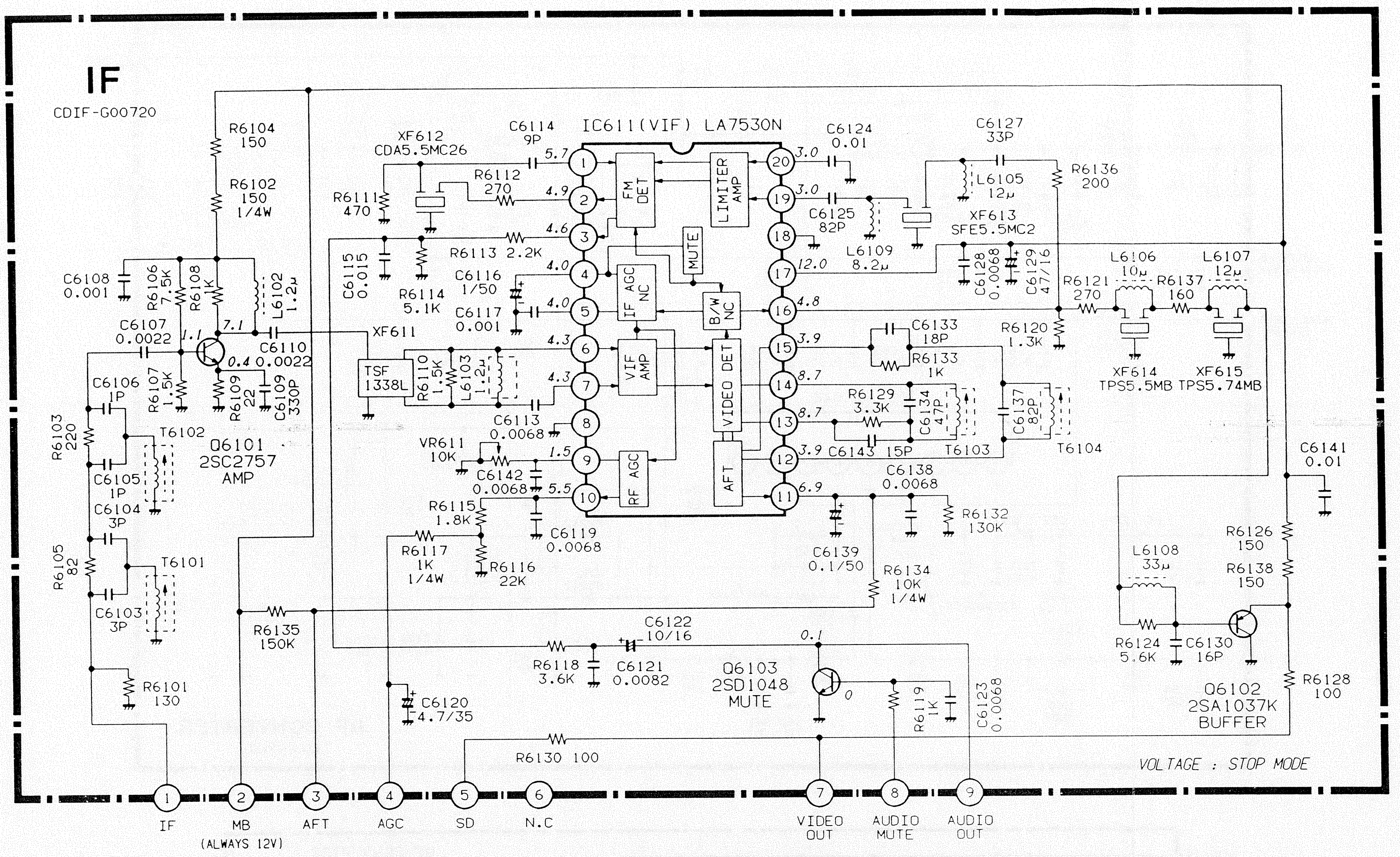
2-25. TN-7 CIRCUIT BOARD


TN-7
T6901
IC691
C6902
Q6921
C6904
C6924
C6925
CN691
R6901
R6902
R6903
R6904
R6905
R6906
R6907
R6908
R6909
R6910
R6912
R6921
R6922
R6923
R6924
R6926
R6927
©JCI-AuH
1AC4B10A42200B

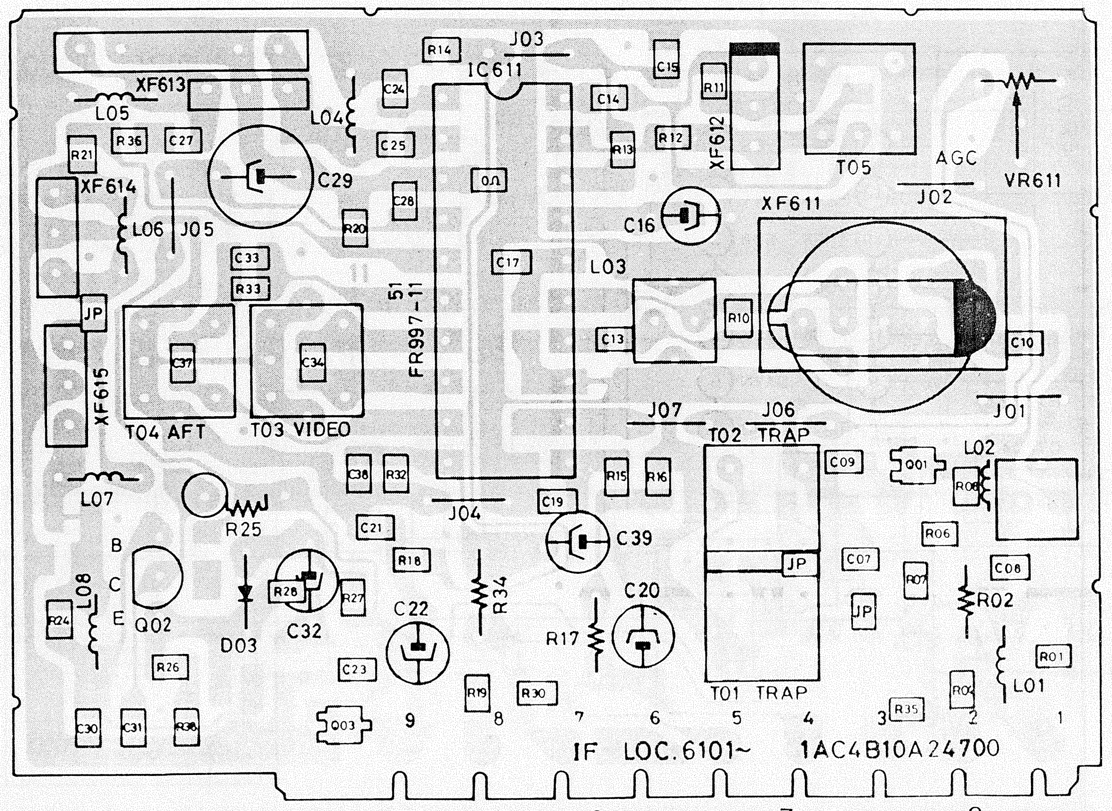
2-26. TM-8 CIRCUIT BOARD (VR 3731VPS ONLY)


TM-8
1AC4B10A41400B
R7810
R7811
R7808
R7812
R7806
R7807
R7802
R7803
R7804
R7801
R7805
R7813
C7803
C7804
C7805
C7806
IC781
CN781
©JCI-AuH

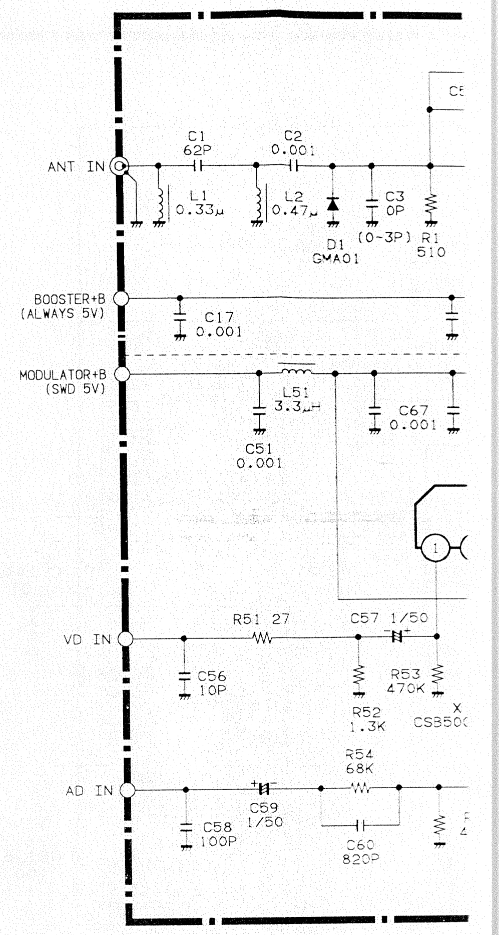
2-27. IF CIRCUIT DIAGRAM

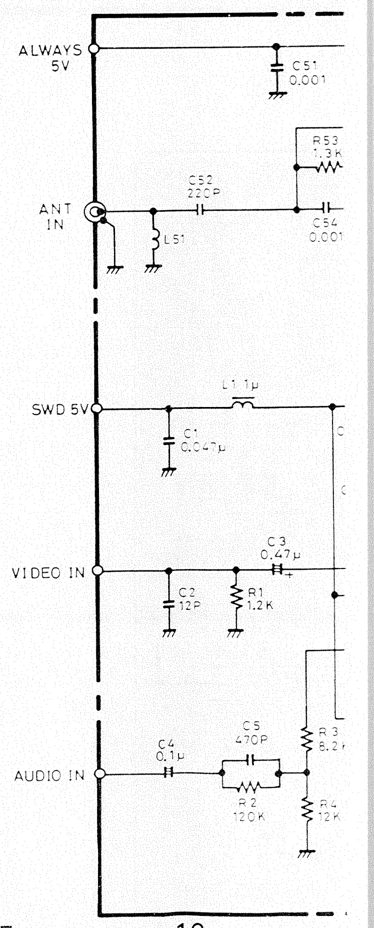

IF
CDIF-G00720
IC611(VIF) LA7530N
FM DET
LIMITER AMP
MUTE
IF AGC NC
B/W NC
VIF AMP
VIDEO DET
RF AGC
AFT
XF612 CDA5.5MC26
XF611
TSF 1338L
XF613 SFE5.5MC2
XF614 TPS5.5MB
XF615 TPS5.74MB
Q6101 2SC2757 AMP
Q6102 2SA1037K BUFFER
Q6103 2SD1048 MUTE
T6101
T6102
T6103
T6104
R6104 150
R6102 150 1/4W
R6111 470
R6112 270
R6113 2.2K
R6114 5.1K
R6110 1.5K
R6115 1.8K
R6116 22K
R6117 1K 1/4W
R6118 3.6K
R6119 1K
R6120 1.3K
R6121 270
R6124 5.6K
R6126 150
R6128 100
R6129 3.3K
R6130 100
R6132 130K
R6133 1K
R6134 10K 1/4W
R6135 150K
R6136 200
R6137 160
R6138 150
R6101 130
R6103 220
R6105 82
R6106 7.5K
R6107 1.5K
R6108 1K
R6109 22
VR611 10K
C6108 0.001
C6107 0.0022
C6110 0.0022
C6109 330P
C6106 1P
C6105 1P
C6104 3P
C6103 3P
C6114 9P
C6115 0.015
C6116 1/50
C6117 0.001
C6113 0.0068
C6142 0.0068
C6119 0.0068
C6120 4.7/35
C6121 0.0082
C6122 10/16
C6123 0.0068
C6124 0.01
C6125 82P
C6127 33P
C6128 0.0068
C6129 47/16
C6130 16P
C6133 18P
C6134 47P
C6137 82P
C6138 0.0068
C6139 0.1/50
C6141 0.01
C6143 15P
L6102 1.2μ
L6103 1.2μ
L6105 12μ
L6106 10μ
L6107 12μ
L6108 33μ
L6109 8.2μ
VOLTAGE : STOP MODE
1 IF
2 MB (ALWAYS 12V)
3 AFT
4 AGC
5 SD
6 N.C
7 VIDEO OUT
8 AUDIO MUTE
9 AUDIO OUT

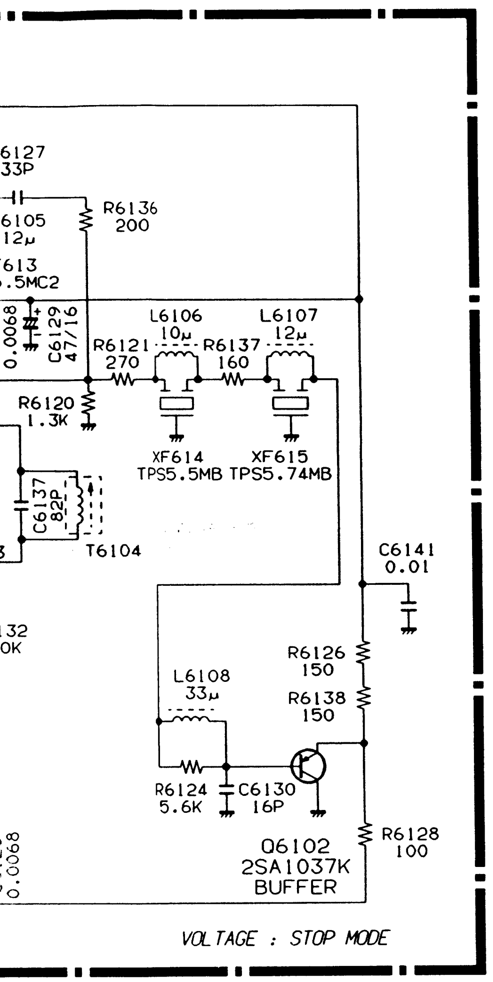
2-28. IF CIRCUIT BOARD

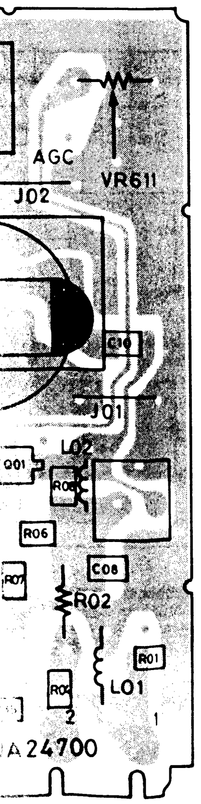

IC611
J03
XF613
XF614
XF615
XF612
XF611
L05
L04
L06
J05
L03
C29
C16
T05
AGC
VR611
J02
T04 AFT
T03 VIDEO
FR997-11
J07
T02
J06 TRAP
J01
L02
L07
R25
J04
C39
Q02
D03
C32
C22
C20
R34
R17
R02
L01
L08
T01 TRAP
IF LOC.6101~
1AC4B10A24700

Note: Either one of these RF converters, type CDRF-G00370 or CDRF-G00010 is used, depending on availability.

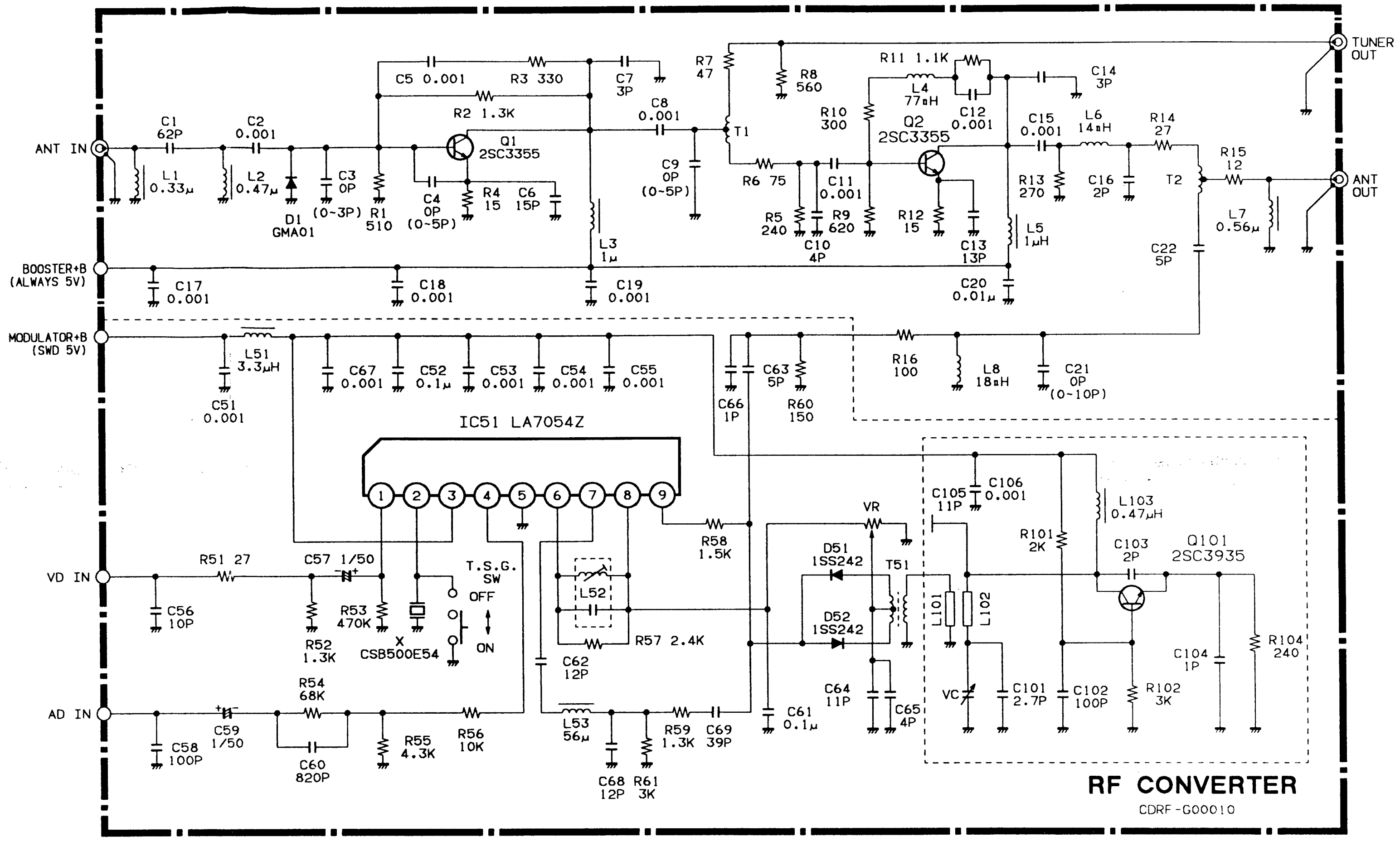

ANT IN
BOOSTER+B (ALWAYS 5V)
MODULATOR+B (SWD 5V)
VD IN
AD IN
C1 62P
C2 0.001
L1 0.33μ
L2 0.47μ
C3 0P (0-3P)
D1 GMA01
R1 510
C17 0.001
L51 3.3μ
C51 0.001
C67 0.001
R51 27
C57 1/50
C56 10P
R53 470K
R52 1.3K
R54 68K
C58 100P
C59 1/50
C60 820P


ALWAYS 5V
ANT IN
SWD 5V
VIDEO IN
AUDIO IN
C51 0.001
C52 22P
L51
C54 0.001
L1 1μ
C1 0.047μ
C2 12P
R1 1.2K
C3 0.47μ
C4 0.1μ
C5 470P
R2 120K
R3 8.2K
R4 12K

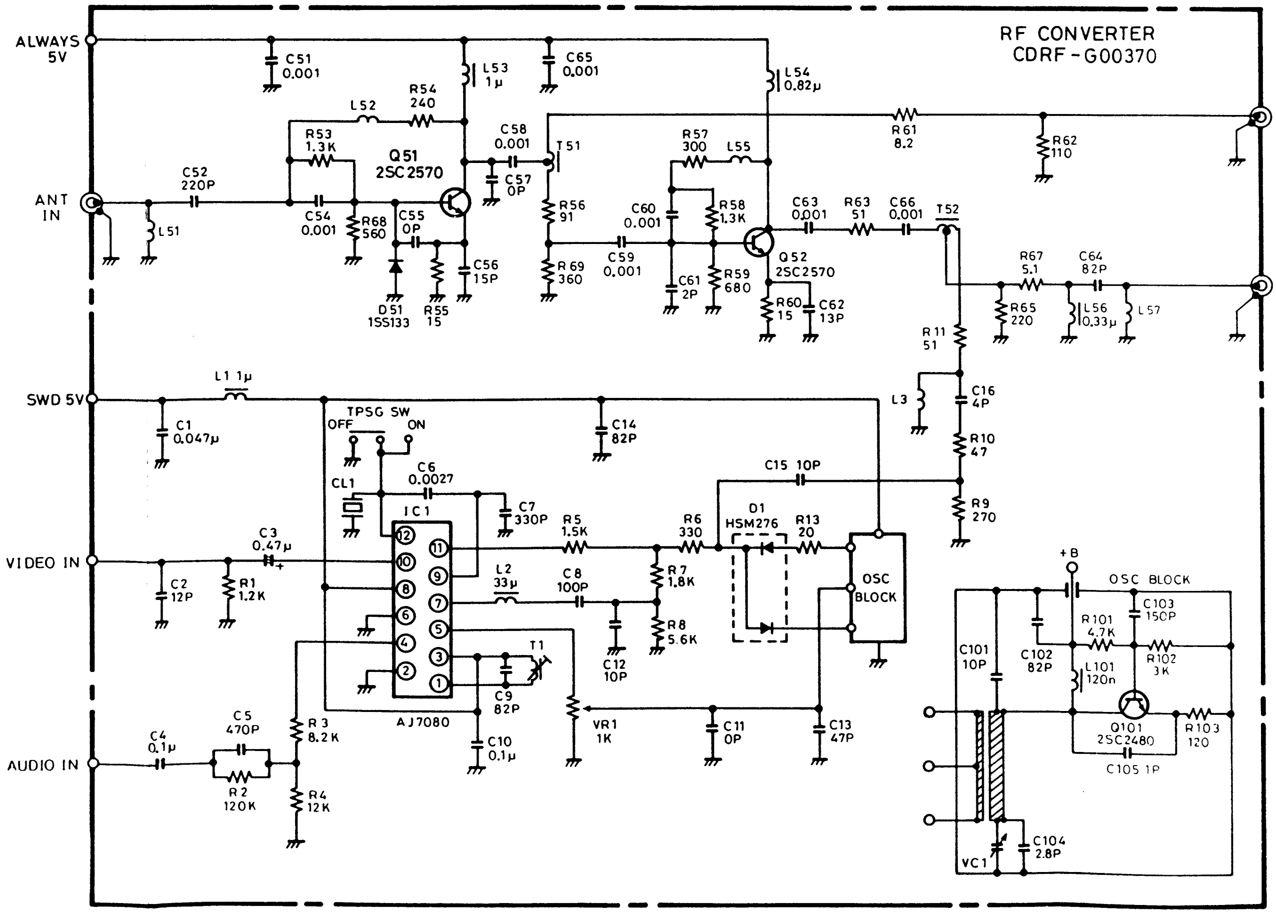

6127
33P
6105
12μ
R6136
200
613
.5MC2
L6106
10μ
L6107
12μ
R6121
270
R6137
160
R6120
1.3K
XF614
TPS5.5MB
XF615
TPS5.74MB
C6137
82P
T6104
C6141
0.01
R6126
150
R6138
150
L6108
33μ
R6124
5.6K
C6130
16P
Q6102
2SA1037K
BUFFER
R6128
100
VOLTAGE : STOP MODE


AGC
VR611
J02
J01
Q01
R06
C08
R02
R01
L01
A24700

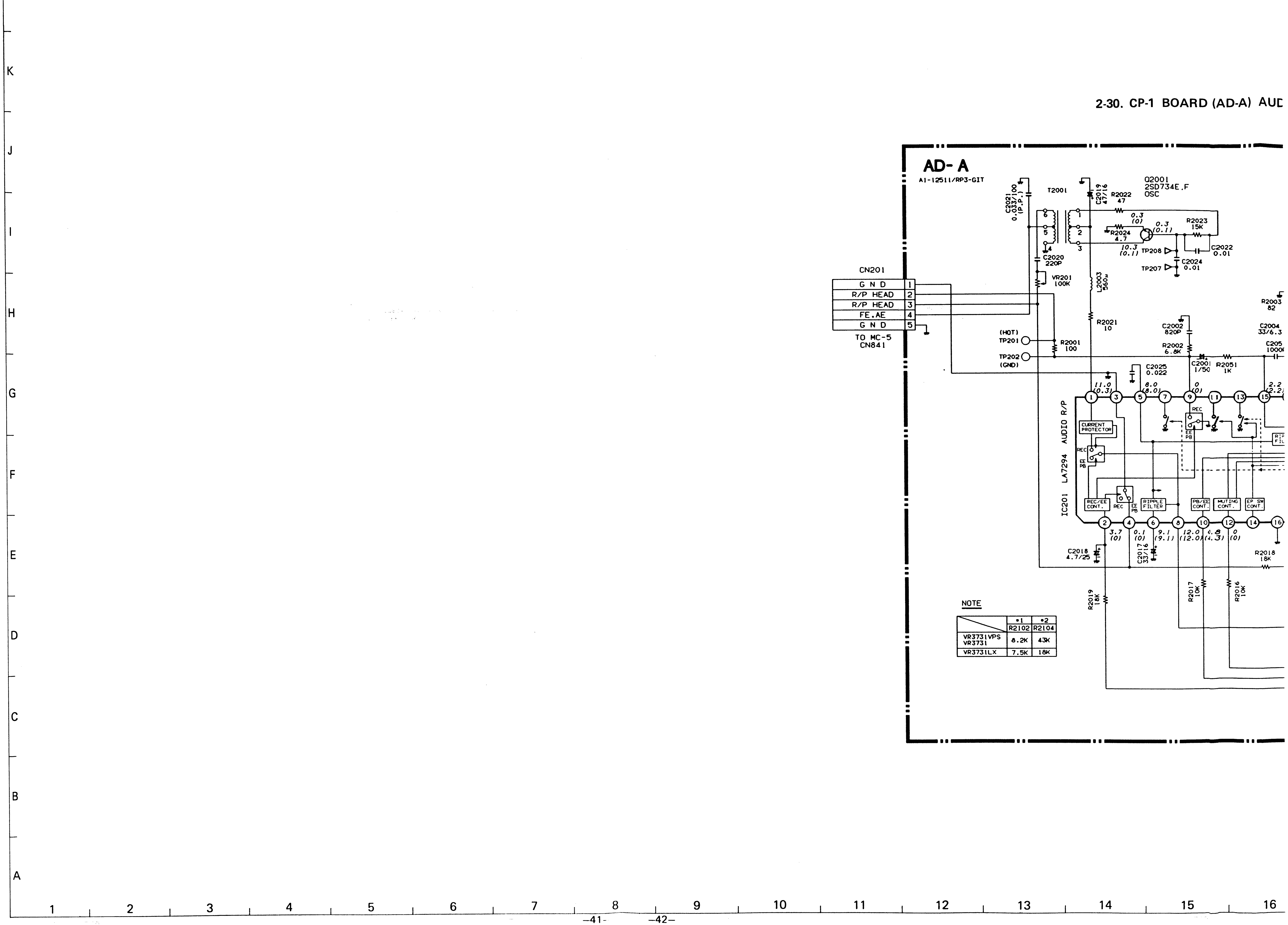
2-29. RF CONVERTER CIRCUIT


ANT IN
BOOSTER+B
(ALWAYS 5V)
MODULATOR+B
(SWD 5V)
VD IN
AD IN
TUNER OUT
ANT OUT
C1
62P
L1
0.33μ
C2
0.001
L2
0.47μ
D1
GMA01
C3
0P
(0-3P)
R1
510
C5 0.001
R3 330
R2 1.3K
Q1
2SC3355
C4
0P
(0-5P)
R4
15
C6
15P
C7
3P
C8
0.001
C9
0P
(0-5P)
L3
1μ
R7
47
T1
R8
560
R11 1.1K
L4
77nH
C12
0.001
C14
3P
R10
300
Q2
2SC3355
C15
0.001
L6
14nH
R14
27
R15
12
R6 75
C11
0.001
R5
240
R9
620
C10
4P
R12
15
C13
13P
L5
1μH
R13
270
C16
2P
T2
L7
0.56μ
C22
5P
C17
0.001
C18
0.001
C19
0.001
C20
0.01μ
L51
3.3μH
C51
0.001
C67
0.001
C52
0.1μ
C53
0.001
C54
0.001
C55
0.001
C66
1P
C63
5P
R60
150
R16
100
L8
18nH
C21
0P
(0-10P)
IC51 LA7054Z
1 2 3 4 5 6 7 8 9
R58
1.5K
R51 27
C56
10P
C57 1/50
R53
470K
R52
1.3K
X
CSB500E54
T.S.G.
SW
OFF
ON
L52
R57 2.4K
C62
12P
R54
68K
C58
100P
C59
1/50
C60
820P
R55
4.3K
R56
10K
L53
56μ
C68
12P
R61
3K
R59
1.3K
C69
39P
C61
0.1μ
D51
1SS242
D52
1SS242
T51
VR
C64
11P
C65
4P
C105
11P
C106
0.001
L103
0.47μH
R101
2K
C103
2P
Q101
2SC3935
L101
L102
VC
C101
2.7P
C102
100P
R102
3K
C104
1P
R104
240
RF CONVERTER
CDRF-G00010

Note: Either one of these RF converters, type CDRF-G00370 or CDRF-G00010 is used, depending on availability.


RF CONVERTER
CDRF-G00370
ALWAYS 5V
ANT IN
SWD 5V
VIDEO IN
AUDIO IN
TUNER OUT
ANT OUT
C51
0.001
L53
1μ
C65
0.001
L54
0.82μ
L52
R54
240
R53
1.3K
Q51
2SC2570
C58
0.001
T51
C57
0P
C52
220P
L51
C54
0.001
R68
560
C55
0P
C56
15P
D51
1SS133
R55
15
R56
91
R69
360
C60
0.001
C59
0.001
R57
300
L55
R58
1.3K
C61
2P
R59
680
Q52
2SC2570
R60
15
C62
13P
C63
0.001
R63
51
C66
0.001
T52
R61
8.2
R62
110
R67
5.1
C64
82P
R65
220
L56
0.33μ
L57
R11
51
L3
C16
4P
R10
47
R9
270
L1 1μ
C1
0.047μ
TPSG SW
OFF
ON
C14
82P
C6
0.0027
CL1
IC1
C7
330P
R5
1.5K
R6
330
D1
HSM276
R13
20
C15 10P
OSC
BLOCK
C3
0.47μ
C2
12P
R1
1.2K
L2
33μ
C8
100P
R7
1.8K
R8
5.6K
C12
10P
T1
C9
82P
AJ7080
VR1
1K
C11
0P
C13
47P
C4
0.1μ
C5
470P
R2
120K
R3
8.2K
R4
12K
C10
0.1μ
+B
OSC BLOCK
C101
10P
C102
82P
R101
4.7K
C103
15CP
L101
120n
R102
3K
Q101
2SC2480
R103
120
C105 1P
VC1
C104
2.8P

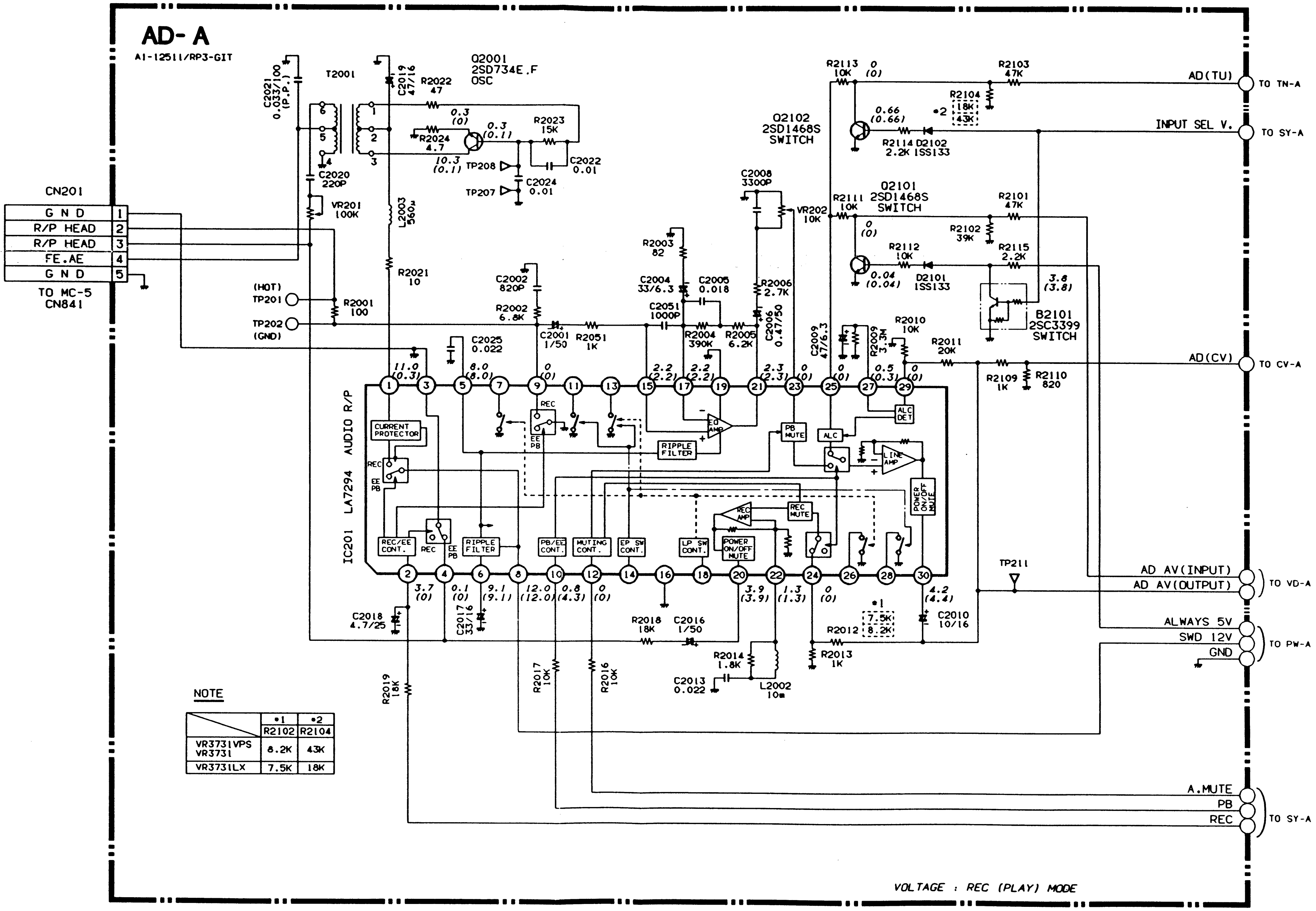
2-30. CP-1 BOARD (AD-A) AUD


AD- A
A1-12511/RP3-GIT
CN201
1 G N D
2 R/P HEAD
3 R/P HEAD
4 FE.AE
5 G N D
TO MC-5
CN841
C2021
0.033/100
(P.P.)
T2001
C2019
47/16
R2022
47
Q2001
2SD734E.F
OSC
R2023
15K
R2024
4.7
0.3
(0)
0.3
(0.1)
10.3
(0.1)
TP208
TP207
C2022
0.01
C2024
0.01
C2020
220P
VR201
100K
L2003
560μ
R2021
10
(HOT)
TP201
TP202
(GND)
R2001
100
C2002
820P
R2002
6.8K
C2001
1/50
R2051
1K
C2025
0.022
R2003
82
C2004
33/6.3
C205
1000
IC201 LA7294 AUDIO R/P
11.0
(0.3)
8.0
(8.0)
0
(0)
2.2
(2.2)
REC
CURRENT
PROTECTOR
REC
EE
PB
REC/EE
CONT.
REC
EE
PB
RIPPLE
FILTER
PB/EE
CONT.
MUTING
CONT.
EP SW
CONT.
3.7
(0)
0.1
(0)
9.1
(9.1)
12.0
(12.0)
0.8
(4.3)
0
(0)
C2018
4.7/25
C2017
33/16
R2018
18K
R2019
18K
R2017
10K
R2016
10K
K
J
I
H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

NOTE

	•1	•2
	R2102	R2104
VR3731VPS VR3731	8.2K	43K
VR3731LX	7.5K	18K

2-30. CP-1 BOARD (AD-A) AUDIO CIRCUIT DIAGRAM


AD- A
A1-12511/RP3-GIT
CN201
G N D
R/P HEAD
R/P HEAD
FE.AE
G N D
TO MC-5
CN841
(HOT)
TP201
TP202
(GND)
C2021
0.033/100
(P.P.)
T2001
C2019
47/16
R2022
47
Q2001
2SD734E.F
OSC
R2024
4.7
R2023
15K
C2022
0.01
TP208
TP207
C2024
0.01
C2020
220P
VR201
100K
L2003
560µ
R2021
10
R2001
100
C2002
820P
R2002
6.8K
C2025
0.022
C2001
1/50
R2051
1K
R2003
82
C2004
33/6.3
C2005
0.018
C2051
1000P
R2004
390K
R2005
6.2K
C2006
0.47/50
R2006
2.7K
C2008
3300P
VR202
10K
Q2102
2SD1468S
SWITCH
R2113
10K
R2114
2.2K
D2102
1SS133
R2104
18K
43K
R2103
47K
R2111
10K
Q2101
2SD1468S
SWITCH
R2101
47K
R2102
39K
R2112
10K
R2115
2.2K
D2101
1SS133
B2101
2SC3399
SWITCH
C2009
47/6.3
R2009
3.3K
R2010
10K
R2011
20K
R2109
1K
R2110
820
AD(TU)
TO TN-A
INPUT SEL V.
TO SY-A
AD(CV)
TO CV-A
IC201 LA7294 AUDIO R/P
CURRENT PROTECTOR
REC
EE
PB
REC/EE CONT.
RIPPLE FILTER
PB/EE CONT.
MUTING CONT.
EP SW CONT.
LP SW CONT.
POWER ON/OFF MUTE
REC AMP
REC MUTE
EQ AMP
PB MUTE
ALC
ALC DET
LINE AMP
POWER ON/OFF MUTE
C2018
4.7/25
C2017
33/16
R2019
18K
R2017
10K
R2016
10K
R2018
18K
C2016
1/50
R2014
1.8K
C2013
0.022
L2002
10m
R2012
7.5K
8.2K
R2013
1K
C2010
10/16
TP211
AD AV(INPUT)
AD AV(OUTPUT)
TO VD-A
ALWAYS 5V
SWD 12V
GND
TO PW-A
A.MUTE
PB
REC
TO SY-A
VOLTAGE : REC (PLAY) MODE

NOTE

	*1	*2
	R2102	R2104
VR3731VPS VR3731	8.2K	43K
VR3731LX	7.5K	18K

2-31. IC301 (μPD75516) SYSTEM CONTROL MPU PIN FUNCTIONS TABLE

NO.	Name	I/O	I/O Signal Function
1	$\overline{\text{TAPE END.S}}$	I	Sensor signal input for tape end detection.
2	A/D REF	I	Reference voltage input for internal A/D conversion circuit. (5 Vdc)
3	VDD		IC power supply input. (5 Vdc)
4	VDD		IC power supply input. (5 Vdc)
5	NOISE ADVANCE P.	O	Pulse for noise band advance in STILL mode.
6	INSERT HIGH	O	"HIGH" output in video signal insert mode. (Models equipped with FE heads.)
7	AF REC	O	"HIGH" output in video signal insert mode, signal to activate FE head.
8	A.DUB	O	"HIGH" output in audio dubbing mode.
9	AUDIO SEL.R	O	Output select signal for stereo audio signals. (ST/L/R/NORMAL).
10	AUDIO SEL.L		
11	INPUT SEL.V	O	Signal for selecting video input signal. (TUNER/EXTERNAL/S.C.)
12	INPUT SEL.A	O	Signal for selecting audio input signal. (TUNER/EXTERNAL/S.C.)
13	S-VHS AUTO/$\overline{\text{OFF}}$	I	S-VHS auto mode selection terminal.
14	BIAS CONTROL	O	Signal for switching full-width erasing head OFF when "HIGH" and ON when "LOW".
15	A REC MUTE	O	Signal to disable output or recording of NORMAL audio.
16	A MUTE	O	Signal to disable audio signal output.
17	NORMAL/$\overline{\text{S-VHS}}$	I	NORMAL (VHS) /S-VHS selection terminal. Normal VHS when "HIGH".
18	$\overline{\text{SV S.DATA}}$	O	Outputs 8-bit × 4 serial data giving operation mode and tracking data, etc., to digital servo IC. CLK is its clock pulse.
19	$\overline{\text{SV S.CLK}}$		
20	4K-PWM	O	Outputs 4 kHz PWM signal for set period at start of high-speed FF/REW.
21	REV HIGH	O	Signal giving skew correction in LP SEARCH mode. (PAL models only)
22	–	–	
23	VD REC	O	Signal indicating recording of video signal in insert mode. (Models equipped with FE head only)
24	FE CONTROL	O	Signal indicating operation of FE head in insert mode. (Models equipped with FE head only)
25	TITL REC	O	Title insert mode indication signal.
26	SPECIAL PLAY	O	Output in special playback modes (R/L-SEARCH, × 2S, STILL, SLOW, F-ADVANCE, A-DUB PAUSE).
27	REC	O	Recording indication signal.
28	$\overline{\text{STILL + SLOW}}$	O	"LOW" output in STILL/SLOW mode for control on-screen IC.
29	ANT/$\overline{\text{VIDEO}}$	O	Antenna through or video deck RF output select (Video when LOW).
30	P.B. HIGH	O	Signal indicating playback image output.
31	FF + REW	O	"HIGH" output during FF or REW mode.
32	POWER UP	O	"HIGH" output except when power is off. Indicates that power is ON.
33	GND		IC ground terminal.
34	$\overline{\text{SAFETY SW}}$	I	Input terminal for accidental erasure prevention switch. No operating to recording mode while "LOW" is input.
35	$\overline{\text{SW DATA 3}}$	I	3-bit signal indicating operation position of mechanism.
36	$\overline{\text{SW DATA 2}}$		
37	$\overline{\text{SW DATA 1}}$		
38	–	–	Pull-up (5 Vdc)
39	FL START SW	I	Switch input indicating start of cassette loading or discharge by front mechanism.
40	60 PWM	O	PWM signal output at high speed FF/REW mode.
41	H.SPEED • SEARCH + FF + REW	O	"HIGH" output during SEARCH, FF and REW at high speed mode.
42	AV CONTROL (8PIN)	O	AV terminal (21PIN SOCKET) control signal output.
43	ATR SMPL P	O	Sampling pulse output during auto-tracking operation. (For ATR evaluation)
44	MC-BR	O	Brake signal for capstan motor.
45	MC-F/R	O	Indication signal for capstan motor rotation direction.
46	INSERT $\overline{\text{ON}}$/OFF	I	INSERT function ON/OFF terminal. Function enabled when "LOW".
47	C-FG P.	I	FG pulse input for capstan motor. Signal with frequency of approximately 1 kHz is recognized.
48	T.REEL P.	I	Pulse input for detection of take-up reel table rotation.
49	CTL P.(0/1 CLK)	I	CTL head recording/playback pulse signal input.
50	S.REEL P.	I	Pulse input for detection of supply reel table rotation.
51	$\overline{\text{SSB DATA}}$	I/O	Terminals for communication of mode data with other microprocessors. Data is 8-bit × 12 block serial data. The clock pulse is output from this microcomputer.
52	$\overline{\text{SSB CLK}}$	O	
53	RF SW P.	I	Input of RF switching pulse created by head drum PG.
54	GND	–	IC ground terminal.
55	GND	–	Not used (grounded)
56	–	–	Not used
57	GND	–	IC ground terminal.
58	X1	–	IC clock OSC terminal. Clock frequency is 4 MHz.
59	X2	–	
60	$\overline{\text{RESET}}$	I	Initial reset terminal for IC. Reset when "LOW".
61	0/1 DATA	I	CTL head recording/playback pulse signal input. Used for VISS data detection.
62	ATR $\overline{\text{ON}}$/OFF	I	Auto tracking operation ON/OFF indication signal input. ATR ON when LOW.
63	ENV SW (DOC P.)	I	Video head envelope selection signal input. Used for absorbing (DOC PULSE) STILL noise.
64	–	–	
65	LP HIGH	O	"HIGH" output when tape speed is set to LP mode.
66	LP V • MUTE	O	"HIGH" video mute signal output when tape speed in set to LP mode.
67	–	–	
68	–	–	
69	ML-M	O	Loading motor rotational speed (medium speed) indication signal.
70	ML-L	O	Loading motor rotational speed (low speed) indication signal.
71	ML-R	O	Loading motor rotational direction (REV) indication signal.
72	ML-F	O	Loading motor rotational direction (FWD) indication signal.
73	GND	–	IC ground terminal.
74	JPN/US/PAL	I	Terminal to alter internal specifications for destination areas. (0V input for SP only models, 0.6V input for SP/LP models.)
75	TAPE SPEED	I	Input of result of tape speed determination by digital servo IC.
76	OEM OPTION	I	Terminal to alter internal specifications. (0V input)
77	Hi-Fi ENV	I	AF head envelope detection signal input. (Used for ATR of Hi-Fi models)
78	ENV	I	Video head envelope detection signal input. (Used for ATR)
79	DEW S.	I	Dew sensor input terminal.
80	$\overline{\text{TAPE TOP S.}}$	I	Sensor signal input for tape beginning detection.

P75516-0

2-32. IC351 (LC7418) DIGITAL SERVO IC PIN FUNCTIONS TABLE

Pin No.	I/O Terminal Name	I/O	Input/Output Function
1	ROTARY	O	Outputs the head switching control signal for 4-head and 3-head models.
2	H-AMP-SW	O	
3	RF-SW-PULSE	O	Video head switching pulse output.
4	AF-SW-PULSE	O	Audio head (FM) switching pulse output.
5	DL1	I	Dummy V_D insertion position control CR.
6	DL2	I	Dummy V_D insertion position control terminal.
7	CTL-IN	I	Control signal input.
8	REMAK	O	Outputs the control signal re-recording control signal. Three-value output (H, M, L).
9	REC-CTL	O	Recording control signal output. Three-value output (H, OPEN, L).
10	D-P	O	Outputs the drum compensation pulse in the slow mode.
11	D-PG. MM	I	CR for drum PG signal delay.
12	D-PG	I	Drum PG signal input.
13	D-FG	I	Drum FG signal input.
14	DSE	O	Outputs the speed error for drum system speed control. An output making the drum motor stop is delivered when DRUM-ON is "0". The lower three bits of the output data forms R-2R ladder network and the 4th bits for DAC (D/A Converter) and upper 5th to 8th bits for PWM (Pulse Width Modulation).
15	FHE	O	Outputs the horizontal sync signal of the composite sync signal after F-V conversion (using the drum phase control system). The lower three bits of the output data forms R-2R ladder network and the 4th bits for DAC (D/A Converter) and upper 5th to 8th bits for PWM (Pulse Width Modulation).
16	DPE		Error output for drum system phase control. The lower three bits of the output data forms R-2R ladder network and the 4th bits for DAC (D/A Converter) and upper 5th to 8th bits for PWM (Pulse Width Modulation).
17	C-P	O	Outputs the capstan compensation pulse in the slow mode.
18	C-START/STP	O	Outputs the capstan motor start and brake pulses in the slow mode.
19	V_{DD}		+ 5V ± 10%
20	CSE	O	Capstan system speed error output. An output making the capstan motor stop is delivered when CAP-ON is "0". The lower three bits of the output data forms R-2R ladder network and the 4th bits for DAC (D/A Converter) and upper 5th to 8th bits for PWM (Pulse Width Modulation).
21	CPE	O	Capstan system phase reciprocal error output. The lower three bits of the output data forms R-2R ladder network and the 4th bits for DAC (D/A Converter) and upper 5th to 8th bits for PWM (Pulse Width Modulation).
22	$\overline{\text{F}}$/R	O	Capstan motor forward/reverse control output. "1" sets the reverse mode, and "0" the forward mode.
23	C-FG1	I	Capstan FG signal input.
24	C-FG2	I	2nd capstan FG signal input. Used for stop detection in the intermittent slow mode.
25	EP/LP/SP	O	Recording mode output. Three-value output ("H" is for EP mode, "M" for LP mode and "L" for SP mode).
26	$\overline{\text{SP}}$	O	Recording mode output. "L" is for SP mode.
27	SP	O	Recording mode output. "H" is for SP mode.
28	MC-BR	I	Control input for capstan brake timing.
29	SLOW-TRK-CR	I	CR for slow tracking adjustment.
30	TRK-CR	I	CR for tracking adjustment.
31	D-PH	I	CR for drum compensation timing adjustment in the slow mode.
32	D-WD1	I	
33	D-WD2	I	
34	REF-TRK	O	Outputs the tracking delay input signal.
35	SLOW/STILL	O	Internal mode signal output. "H" in the slow mode.
36	MODE (× 2+STILL)	O	Mode decoding signal output. At the × 2 SPEED mode and starting time of SLOW/STILL mode, output "H" level.
37	INDEX-CLK	O	Outputs the timing for the control signal duty detector.
38	INDEX-DATA	O	Outputs the control signal duty detection results.
39	SV-S • CLK	I	Serial transmission clock pulse input.
40	SV-S • DATA	I	Serial data input terminal.
41	NTSC/$\overline{\text{PAL}}$	I	NTSC/PAL switching input. "H" is for NTSC, "L" for PAL.
42	REF	O	Outputs the internal reference signal.
43	V_{DD}		+ 5V supply terminal
44	FSC IN	I	Input for the IC internal system clock pulse. A level of at least 0.3 Vp-p is required. The color subcarrier signal is input by capacitive coupling.
45	V_{SS}		Ground
46	C-SYNC	I	Composite sync signal input.
47	ENV SW	I	Head selection signal (PB envelope detection signal) input for 4-head special playback.
48	VD	O	Dummy V_D signal output.

LC7418

2-33. IC7

Pin No.
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NOTE

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s clock pulse.

is input.

data.

P75516-0

2-32. IC351 (LC7418) DIGITAL SERVO IC PIN FUNCTIONS TABLE

Pin No.	I/O Terminal Name	I/O	Input/Output Function
1	ROTARY	O	Outputs the head switching control signal for 4-head and 3-head models.
2	H-AMP-SW	O	
3	RF-SW-PULSE	O	Video head switching pulse output.
4	AF-SW-PULSE	O	Audio head (FM) switching pulse output.
5	DL1	I	Dummy V_D insertion position control CR.
6	DL2	I	Dummy V_D insertion position control terminal.
7	CTL-IN	I	Control signal input.
8	REMAK	O	Outputs the control signal re-recording control signal. Three-value output (H, M, L).
9	REC-CTL	O	Recording control signal output. Three-value output (H, OPEN, L).
10	D-P	O	Outputs the drum compensation pulse in the slow mode.
11	D-PG. MM	I	CR for drum PG signal delay.
12	D-PG	I	Drum PG signal input.
13	D-FG	I	Drum FG signal input.
14	DSE	O	Outputs the speed error for drum system speed control. An output making the drum motor stop is delivered when DRUM-ON is "0". The lower three bits of the output data forms R-2R ladder network and the 4th bits for DAC (D/A Converter) and upper 5th to 8th bits for PWM (Pulse Width Modulation).
15	FHE	O	Outputs the horizontal sync signal of the composite sync signal after F-V conversion (using the drum phase control system). The lower three bits of the output data forms R-2R ladder network and the 4th bits for DAC (D/A Converter) and upper 5th to 8th bits for PWM (Pulse Width Modulation).
16	DPE		Error output for drum system phase control. The lower three bits of the output data forms R-2R ladder network and the 4th bits for DAC (D/A Converter) and upper 5th to 8th bits for PWM (Pulse Width Modulation).
17	C-P	O	Outputs the capstan compensation pulse in the slow mode.
18	C-START/STP	O	Outputs the capstan motor start and brake pulses in the slow mode.
19	V_{DD}		+5V ± 10%
20	CSE	O	Capstan system speed error output. An output making the capstan motor stop is delivered when CAP-ON is "0". The lower three bits of the output data forms R-2R ladder network and the 4th bits for DAC (D/A Converter) and upper 5th to 8th bits for PWM (Pulse Width Modulation).
21	CPE	O	Capstan system phase reciprocal error output. The lower three bits of the output data forms R-2R ladder network and the 4th bits for DAC (D/A Converter) and upper 5th to 8th bits for PWM (Pulse Width Modulation).
22	$\overline{F}$/R	O	Capstan motor forward/reverse control output. "1" sets the reverse mode, and "0" the forward mode.
23	C-FG1	I	Capstan FG signal input.
24	C-FG2	I	2nd capstan FG signal input. Used for stop detection in the intermittent slow mode.
25	EP/LP/SP	O	Recording mode output. Three-value output ("H" is for EP mode, "M" for LP mode and "L" for SP mode).
26	$\overline{SP}$	O	Recording mode output. "L" is for SP mode.
27	SP	O	Recording mode output. "H" is for SP mode.
28	MC-BR	I	Control input for capstan brake timing.
29	SLOW-TRK-CR	I	CR for slow tracking adjustment.
30	TRK-CR	I	CR for tracking adjustment.
31	D-PH	I	CR for drum compensation timing adjustment in the slow mode.
32	D-WD1	I	
33	D-WD2	I	
34	REF-TRK	O	Outputs the tracking delay input signal.
35	SLOW/STILL	O	Internal mode signal output. "H" in the slow mode.
36	MODE (×2+STILL)	O	Mode decoding signal output. At the ×2 SPEED mode and starting time of SLOW/STILL mode, output "H" level.
37	INDEX-CLK	O	Outputs the timing for the control signal duty detector.
38	INDEX-DATA	O	Outputs the control signal duty detection results.
39	SV-S • CLK	I	Serial transmission clock pulse input.
40	SV-S • DATA	I	Serial data input terminal.
41	NTSC/$\overline{PAL}$	I	NTSC/PAL switching input. "H" is for NTSC, "L" for PAL.
42	REF	O	Outputs the internal reference signal.
43	V_{DD}		+5V supply terminal
44	FSC IN	I	Input for the IC internal system clock pulse. A level of at least 0.3 Vp-p is required. The color subcarrier signal is input by capacitive coupling.
45	V_{SS}		Ground
46	C-SYNC	I	Composite sync signal input.
47	ENV SW	I	Head selection signal (PB envelope detection signal) input for 4-head special playback.
48	VD	O	Dummy V_D signal output.

LC7418

2-33. IC711 (M50959) TIMER MPU PIN FUNCTIONS TABLE

Pin No.	Port	Input/Output Signal	I/O	Input/Output Function
1	Vcc			+5V
2	$P6_5$	TXD	O	DATA signal output to VIDEO TEXT (TELETEXT) MPU.
3	$P6_4$	RXD	I	DATA signal input from VIDEO TEXT (TELETEXT) MPU.
4	$P6_3$	PLL CLK	O	Signal input/output of CLOCK, DATA, CE (chip enable) for PLL tuning system IC.
5	$P6_2$	PLL DATA	I/O	
6	$P6_1$	PLL CE	O	
7	$P6_0$/T	ADJUST	O	Pulse output (32.768kHz/1024 = 32Hz) for clock frequency adjustment.
8	$P2_7$	$\overline{CLK}$	O	Clock pulse output to the E^2 PROM.
9	$P2_6$	DI	I/O	Data exchange with the E^2 PROM.
10	$P2_5$	$\overline{E^2\ PROM\ CS1}$	O	E^2 PROM 1 is accessed when "L".
11	$P2_4$	$\overline{BG}$/L	O	Transmission system switching ("L" = PAL BG ; "H" = SECAM L).
12	$P2_3$	VIDEO MUTE	O	"H" output during VIDEO MUTE.
13	$P2_2$	TUNER ON	O	"H" output when power is ON and during VPS scanning.
14	$P2_1$	$\overline{AUDIO\ MUTE}$	O	"L" output during AUDIO MUTE.
15	$P2_0$	TEXT CLK	O	CLOCK signal output to VIDEO TEXT (TELETEXT) MPU.
16	$P3_7$/$\overline{Srdy}$		–	
17	$P3_6$/CLK	$\overline{S.CLK}$	I	SSB clock pulse input.
18	$P3_5$/Sout	$\overline{S.OUT}$	O	SSB data output.
19	$P3_4$/Sin	S.IN	I	SSB data input.
20	$P3_3$/ANin	AFT.C	I	AFT.S curve input.
21	$P3_2$/CNTR	H.SYNC	I	Sync. detection signal input for existing channel discrimination. ("L" = Existing Sync.)
22	$P3_1$	SCL	O	Clock pulse output to the VPS decoder IC.
23	$P3_0$	SDA	I/O	Data exchange with the VPS decoder IC.
24	$P5_3$/INT_1	$\overline{POWER\ DOWN}$	I	Power failure mode set at "L" input.
25	$P5_2$/INT_2	IR SIG. IN	I	Remote control signal input.
26	CNVss			Ground.
27	$\overline{RESET}$			Reset terminal.
28	Xin			6MHz clock terminal.
29	Xout			
30	Xcin			32.768kHz (clock OSC used in the power failure mode)
31	Xcout			
32	Vss			Ground
33	ϕ			
34	$P5_7$	KEY IN4	I	Key inputs
35	$P5_6$	KEY IN3	I	
36	$P5_5$	KEY IN2	I	
37	$P5_4$	KEY IN1	I	
38	Vp	Vp		-30V
39	$P5_1$	STEREO R	O	2-bit signal output for AUDIO OUTPUT SELECT and audio output display indication according to table below.
40	$P5_0$	STEREO L	O	
41	$P1_7$	o	O	Display segment outputs. (Included key-scan output)
42	$P1_6$	n	O	
43	$P1_5$	m	O	
44	$P1_4$	l	O	
45	$P1_3$	k	O	
46	$P1_2$	j	O	
47	$P1_1$	i	O	
48	$P1_0$	G9	O	Display grid outputs.
49	$P0_7$	G8	O	
50	$P0_6$	G7	O	
51	$P0_5$	G6	O	
52	$P0_4$	G5	O	
53	$P0_3$	G4	O	
54	$P0_2$	G3	O	
55	$P0_1$	G2	O	
56	$P0_0$	G1	O	
57	$P4_7$	h	O	Display segment outputs. (Included key-scan output)
58	$P4_6$	g	O	
59	$P4_5$	f	O	
60	$P4_4$	e	O	
61	$P4_3$	d	O	
62	$P4_2$	c	O	
63	$P4_1$	b	O	
64	$P4_0$	a	O	

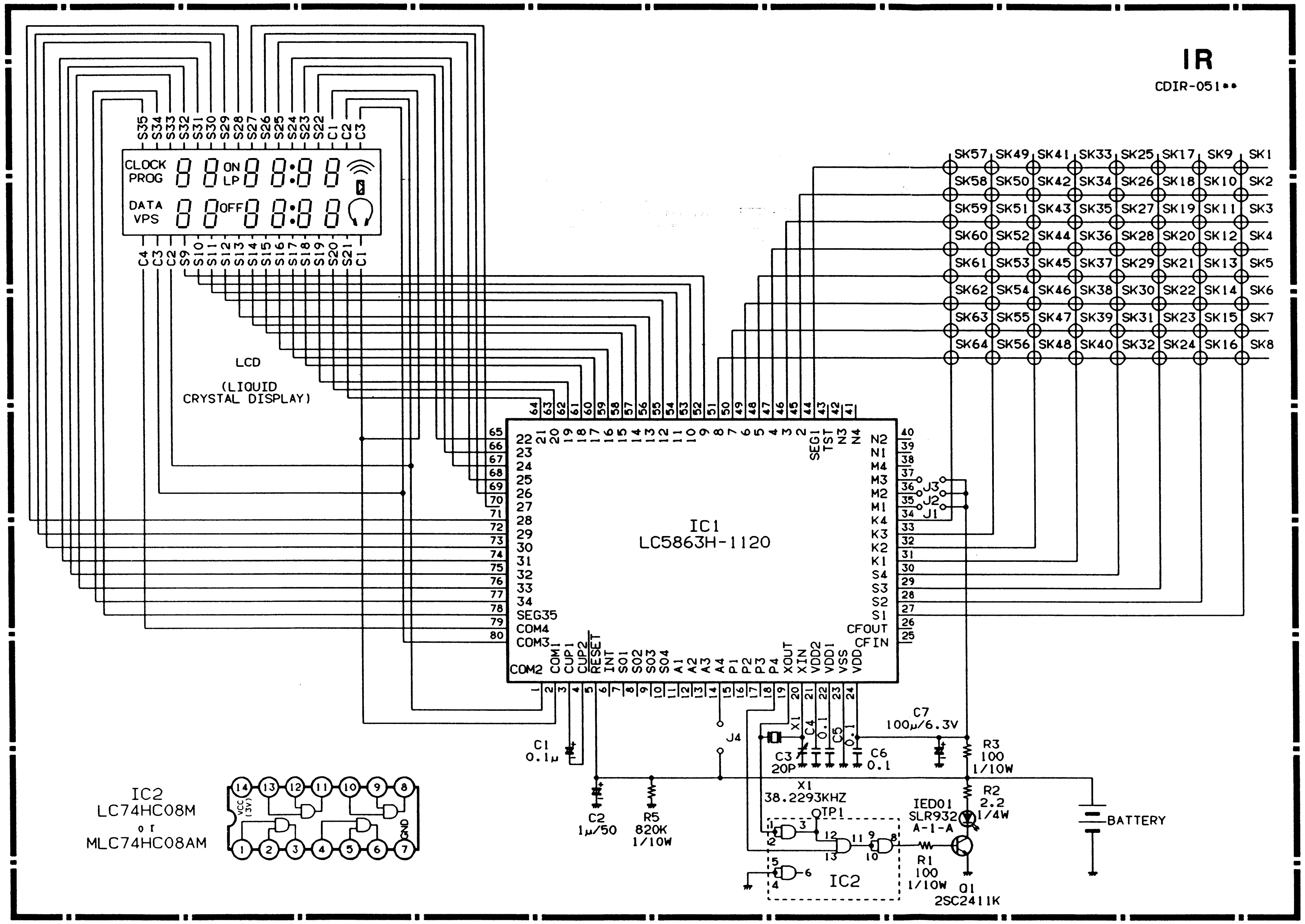
NOTE : Clock frequency check with ADJUST terminal of Pin 7.

1. Connect the anode of the diode (IS188 etc.) to Pin 44 (key-scan l) and the cathode to Pin 37 (KEY IN 1). Then ground the Pin 27 ($\overline{RESET}$) terminal once and reset the microcomputer.
2. The clock frequency (32 Hz) can be observed with the ADJUST terminal of Pin 7 according to the servicing above.
3. In order to set normal function mode again, ground the terminal of Pin 27 ($\overline{RESET}$) once and reset the microcomputer after removing the diode connected to Pins 44 and 37.

PORT / MODE	NORMAL	MAIN	SUB	STEREO
STEREO R (Pin 39)	L	L	H	H
STEREO L (Pin 40)	L	H	L	H

P50959F0

2-34. IR REMOTE CONTROL CIRCUIT DIAGRAM


IR
CDIR-051••
LCD
(LIQUID CRYSTAL DISPLAY)
CLOCK
PROG
DATA
VPS
ON
LP
OFF
IC1
LC5863H-1120
IC2
LC74HC08M
or
MLC74HC08AM
SK1
SK2
SK3
SK4
SK5
SK6
SK7
SK8
C1
0.1μ
C2
1μ/50
R5
820K
1/10W
J4
C3
20P
C4
0.1
C5
0.1
C6
0.1
C7
100μ/6.3V
R3
100
1/10W
X1
38.2293KHZ
TP1
R2
2.2
1/4W
IED01
SLR932
A-1-A
R1
100
1/10W
Q1
2SC2411K
BATTERY
J1
J2
J3

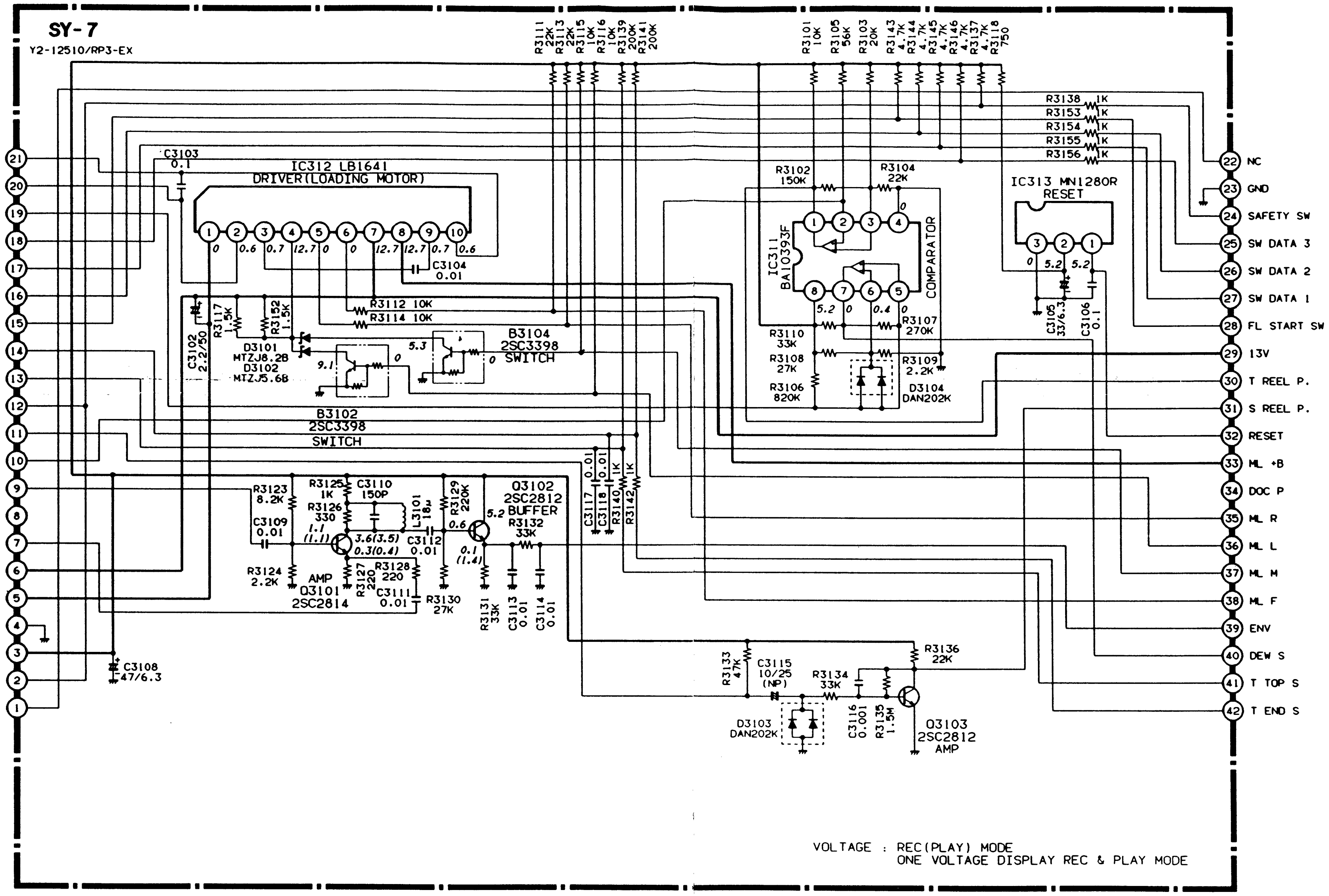
AVAILABLE KEY FUNCTION OF REMOTE CONTROL UNIT

KEY NO.	FUNCTION		KEY NO.	FUNCTION		KEY NO.	FUNCTION	
1	‖ PAUSE	USE	23	MARK	USE	45	✉V CHECK	USE
2	■ STOP	USE	24	✉ CNT M	USE	46	CHSCAN	
3	MODE -	USE	25	←CH +	USE	47	OK	
4	● REC	USE	26	0-AV	USE	48	M.STILL	
5		USE	27	→CH -	USE	49	3	USE
6	MODE +	USE	28	A.SEL		50	2	USE
7	SEARCH	USE	29	P✉ CANCEL	USE	51	1	USE
8	SLOW	USE	30	←		52	VPS	USE *1
9	▶▷FF	USE	31	↑		53	✉R PROG	USE
10	▶ PLAY	USE	32	→		54	M.CALL	
11	BLANK	USE	33	9	USE	55	OSD	
12	◁◀REW	USE	34	8	USE	56	ERASE	
13	A.TR	USE	35	7	USE	57	■))) TRANS	USE
14	C.DISP	USE	36	SC		58	ZOOM	
15	CODE	USE	37	P◷ CLOCK	USE	59	MONITOR	
16	▷0◁ RESET	USE	38	SIZE		60	VCR/TV	
17	EJECT		39	ART		61	◉ POWER	USE
18	R.PLAY		40	INST		62	PRESET	
19	X2S		41	6	USE	63	NR	
20	A.DUB		42	5	USE	64	MUTE	
21	INSERT		43	4	USE			
22	↓		44	SP/LP				

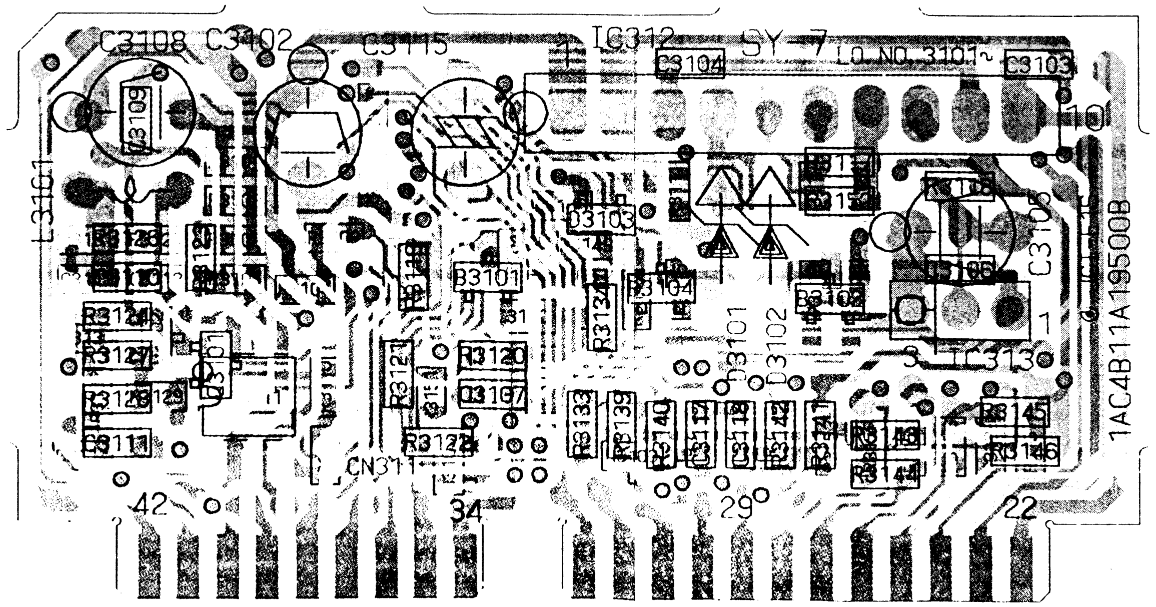
IR-I05119+

	*1
VR3731VPS VR3731	USE
VR3731LX	NOT USE

2-35. SY-7 BOARD LOADING MOTOR DRIVER & SENSOR INPUT CIRCUIT DIAGRAM

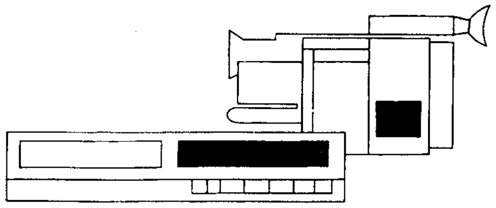

SY-7
Y2-12510/RP3-EX
IC312 LB1641
DRIVER(LOADING MOTOR)
IC311 BA10393F
COMPARATOR
IC313 MN1280R
RESET
B3104 2SC3398 SWITCH
B3102 2SC3398 SWITCH
Q3101 2SC2814 AMP
Q3102 2SC2812 BUFFER
Q3103 2SC2812 AMP
D3101 MTZJ8.2B
D3102 MTZJ5.6B
D3103 DAN202K
D3104 DAN202K
ML + 21
ML - 20
DEW S. 19
SW DATA 3 18
SW DATA 1 17
SW DATA 2 16
FL START SW 15
T END S. 14
T TOP S. 13
SAFETY SW 12
S REEL P. 11
T REEL P. 10
PB Y 9
DOC P 8
ATR SW 7
ALWAYS 13V(MC) 6
GND(MC) 5
GND 4
ALWAYS 5V 3
MEP 2
NC 1
CN311
22 NC
23 GND
24 SAFETY SW
25 SW DATA 3
26 SW DATA 2
27 SW DATA 1
28 FL START SW
29 13V
30 T REEL P.
31 S REEL P.
32 RESET
33 ML +B
34 DOC P
35 ML R
36 ML L
37 ML M
38 ML F
39 ENV
40 DEW S
41 T TOP S
42 T END S
VOLTAGE : REC(PLAY) MODE
ONE VOLTAGE DISPLAY REC & PLAY MODE

2-36. SY-7 CIRCUIT BOARD


SY-7
CN311
42
34
29
22
1AC4B11A19500B

▨ TOP SIDE VIEW
BOTTOM SIDE VIEW

NOKIA
CONSUMER ELECTRONICS



VR

1990

NOKIA UNTERHALTUNGSELEKTRONIK GmbH
Service, Östliche 132, Postfach 1526
D-7530 Pforzheim

Service-Manual

ITT NOKIA

VR 3701, 3701 VPS, 3701 V, 3701 UK, 3701 H
VR 3721, 3721 VPS, 3721 UK
VR 3731, 3731 VPS, 3731 UK
VR 3761 HIFI VPS, 3761 HIFI UK
VR 3761 HIFI NICAM
VR 3781 HIFI VPS, 3781 HIFI NICAM

Luxor

VR 3701 LX, 3721 LX
VR 3731 LX
VR 3761 HIFI NICAM LX
VR 3781 HIFI NICAM LX

OCEANIC

VR 3701 S, 3721 S
VR 3741 MS, 3751 MS

(D) Mechanik-Justagen

Schaltbilder, Leiterplatten, Ersatzteile-Liste und elektrischer Abgleich, siehe Rückseite

⚠ **Sicherheitsbauteil!**
Dieses Symbol kennzeichnet in den Schaltbildern alle Bauteile, die nur durch Originalteile ersetzt werden dürfen.

Bei Reparaturen gültige Sicherheitsvorschriften beachten!

(GB) Mechanical adjustments

Circuit diagrams, P.C.B., spare parts list and electrical alignment, see rear page

⚠ **Safety Component!**
This symbol identifies in the circuit diagrams all safety critical parts. Replace only with specified part numbers.

Service and repair work to be performed only in accordance with existing safety regulations!

(F) Mécanique ajustages

Schémas, circuits imprimés, liste des pièces détachées et alignement, voir page précédante

⚠ **Composant de protection!**
Ce symbol indique tous les composants dans les schémas, qui doivent être remplacés uniquement par des pièces d'origines.

Pendant le dépannage respecter les régulations du sécurité!

Änderungen vorbehalten Modifications reserved Modifications réservées	ITT is a trade mark of ITT Corporation New York, used under license.	**6611 77 06** (611) SA

Liste der Service-Manuale **Liste of Service Manuals** **Liste des manuals**		**Schaltbilder, Leiterplatten, Ersatzteile-Liste** **Circ. diagr., P.C.B.,spare parts list** **Schémas circ. imprimés, liste des pièces détachées**	**Elektrischer Abgleich** **Electrical alignment** **Alignement**	**Mechanik-Justagen** **Mechanical adjustments** **Mécanique ajustages**
	Modell **Model** **Modèle**	**No.**	**No.**	**No.**
ITT NOKIA	VR 3701 VPS	6611 77 04	6611 77 05	6611 77 06
LUXOR	VR 3701 LX			
ITT NOKIA	VR 3701			
ITT NOKIA	VR 3721 VPS			
LUXOR	VR 3721 LX			
ITT NOKIA	VR 3721			
ITT NOKIA	VR 3701 UK	6611 77 07		
ITT NOKIA	VR 3701 V			
ITT NOKIA	VR 3721 UK			
ITT NOKIA	VR 3701 H	6611 77 08		
ITT NOKIA	VR 3731 VPS	6611 77 09	6611 77 10	
ITT NOKIA	VR 3731			
LUXOR	VR 3731 LX			
ITT NOKIA	VR 3731 UK	6611 77 11		
ITT NOKIA	VR 3761 HIFI VPS	6611 77 12	6611 77 13	
ITT NOKIA	VR 3761 HIFI NICAM	6611 77 14		
LUXOR	VR 3761 HIFI NICAM LX			
ITT NOKIA	VR 3761 HIFI UK	6611 77 15		
ITT NOKIA	VR 3781 HIFI VPS	6611 77 16	6611 77 17	
ITT NOKIA	VR 3781 HIFI NICAM	6611 77 18		
LUXOR	VR 3781 HIFI NICAM LX			
OCEANIC	VR 3721 S	6611 77 19	6611 77 20	
OCEANIC	VR 3701 S			
OCEANIC	VR 3741 MS	6611 77 21		
OCEANIC	VR 3751 MS	6611 77 22	6611 77 23	

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1. OUTLINE OF MECHANISM

This mechanism is named P-90 Mechanism. Its features include :

(1) The chassis is fabricated by drawing a 1.6mm thick electric zinc plated steel sheet, and mechanical parts are ingeniously laid on this chassis. The mechanism is as thick as 70.3 mm.

(2) After insertion of a cassette, the tape is normally wound to the head drum based on the full loading system. This design results in the shortening of the mode shift time, that is, the time from the depression of the PLAY pushbutton switch to the video image display on screen has been significantly quickened.

(3) The full loading system employed has the F/R search capability (when the same button (F.FWD or REW) is pressed in the F.FWD or REW modes, the search mode playback image appears on the screen).

(4) Also, a thin type head drum without lead is provided to increase the operating convenience of the equipment to a considerable extent.

(5) The drive source for cassette loading and the motor for the tape loading mode selection are used in combination with the head motor and the capstan motor for realization of a 3-motor system.

1-1. FULL LOADING MECHANISM

(1) Description of full loading mechanism
As shown in Fig. 1-1 a tape has hitherto been wound onto the head drum only in the PLAY and F/R SEARCH mode, but in this radically new mechanism, in every mode can be made with the tape kept wound onto the head drum.

(2) Features of full loading mechanism
With the provision of the full loading mechanism, the operating convenience, which was hitherto a drawback of the VHS system, has been improved. A host of other salient features are also designed into this mechanism as apparent from the following description.

I. Quick playback
Mode shift time such as the STOP→PLAY and FF/REW→PLAY has been shortened for quicker playback.

II. High-speed VISS
The time from the detection of VISS search signal based on the VHS standardized search system till image display on the screen has considerably been shortened to make high-speed VISS possible.

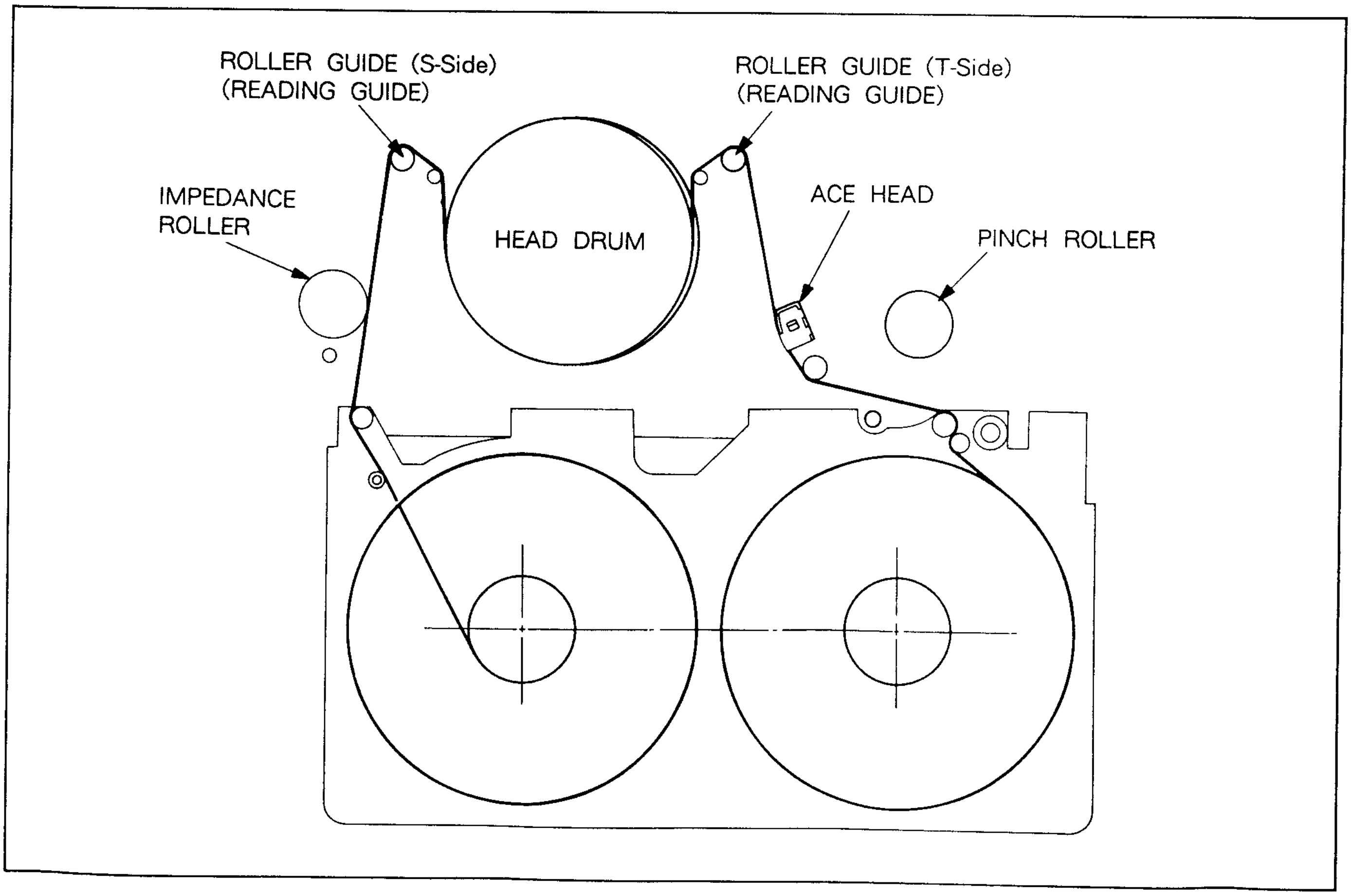


Fig. 1-1 FULL LOADING SYSTEM (AT FF/REW MODE)

III. F/R search
FF↔F-SEARCH and REW↔R-SEARCH can be made direct by reducing the mode transition time.

(3) Protection mechanism for full loading system

I. Video Tape Protection Mechanism
   (a) FF/REW→STOP
   Tape tension applied to the head drum when stopping is lowered by optimizing the balance between the left and right, and brake forces acting on the left and right reel table. Thereby it prevents from causing a scratch on the tape due to V-head when stopping.
   (b) STOP→FF/REW
   The starting-up speed of the capstan motor is ingeniously designed to preclude the possibility of unusual tape tension at the time of REW/FWD start-up.
   (c) Tape end brake damping
   The design of the mechanism is so made that the time from issuance of an electrical STOP command till actual brake application is reduced to a minimum. This enable the braking to be completed before the reader tape end.
   (d) FF/REW running
   To ensure highly stable tape running in any condition• and any environment, design consideration is given to the foundation brake torque (soft brake) to the reel table and the tape winding angle with respect to each tape guide. Particularly in regard to the supply side fixing guide and F.T.E (Full Track Erase) head, the design is so made that they do not come into contact with the tape at the time of FF/REW operation to alleviate load application.

II. Final End Position Tape Loading Protection Mechanism
Tape pull-out (loading) from within the cassette is done to ensure proper take-up of the tape onto the head drum. At that time, the tape is extended from the supply reel side.
So, if the tape is wound to the final end, no loading can be made. For this reason, a mode is designed to allow the tape to be rewound a little at the final end of the tape without any loading done.

2. DESCRIPTION OF MECHANISM OPERATION

2-1. BASIC OPERATION MODE OF MECHANISM

The P-90 mechanism has its original modes such as given in Table 2-1, in addition to the VTR is operation modes (STOP, FF, REW, PLAY, REC, R-SEARCH, F-SEARCH, STILL, SLOW, and ETS). These modes specific to the mechanism play important roles in tape protection operation at the time of a shift to various modes of the VTR above. A shift to the mode specific to the mechanism is carried out by controlling the rotation of the loading motor with the control signal of the system control circuit. The detection of important mechanism operation mode positions is done by using the FL START SWITCH for detecting the cassette ejection/insertion, and the MECHANISM MODE SWITCH for detecting each mode of the mechanism (3 bit MODE DATA is output by operating the rotary switch).

Mechanism Mode	Mechanism Mode Switch			HEX DATA	Function	Main Mode Shifting Conditions	VTR Operation Mode
	3	2	1				
EJECT	–	–	–		Eject position		EJECT
					Front loading/Unloading		
SHORT REW	–	–	–		Take up operation in the tape end position		Low side of ⑥. Sensed upon IN
INITIAL	1	1	1	⑦	Power off position		Power off when tape is loaded completely
					Tape unloading position Tape loading Tape loading ending position		
BRAKE	0	0	1	①	Main brake applying position		
STOP / FF/REW	0	1	0	②	STOP waiting and FF/REW (the head motor rotation)		STOP, FF/REW
STILL	0	1	1	③	The positions of STILL, SLOW or F-ADV.		STILL, SLOW, F-ADV
PLAY	1	0	0	④	From FWD direction Normal running mode		PLAY, REC, F-SEARCH
IDLER	1	0	1	⑤	Forward/reverse changeover position		PAUSE
REV	1	1	0	⑥	From REV direction Normal running mode		R-SEARCH

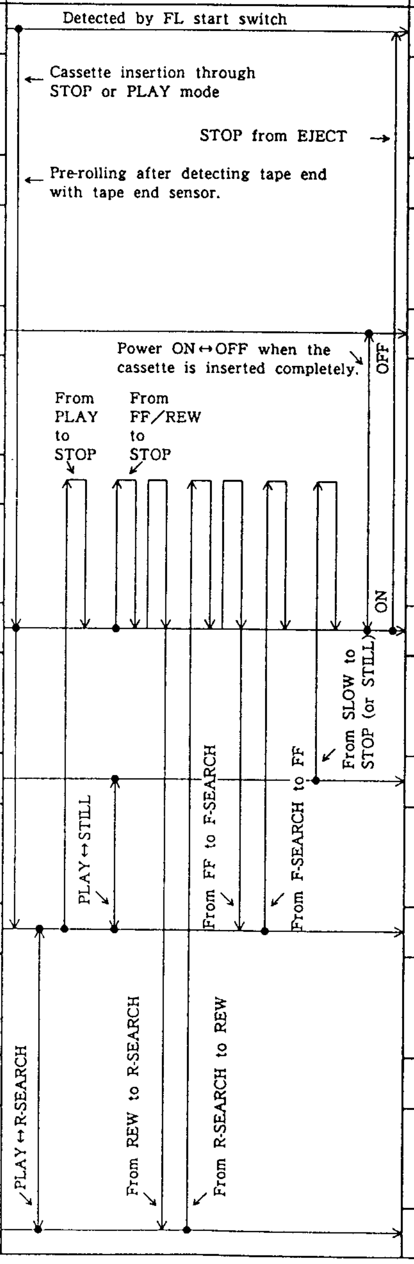

Detected by FL start switch
Cassette insertion through STOP or PLAY mode
STOP from EJECT
Pre-rolling after detecting tape end with tape end sensor.
Power ON↔OFF when the cassette is inserted completely.
OFF
From PLAY to STOP
From FF/REW to STOP
ON
From SLOW to STOP (or STILL)
PLAY↔STILL
From FF to F-SEARCH
From F-SEARCH to FF
PLAY↔R-SEARCH
From REW to R-SEARCH
From R-SEARCH to REW

Table 2-1

2-2. DESCRIPTION OF MECHANISM DRIVE

To realize the thin type mechanism, a loading motor and two pieces of cam (MAIN CAM GEAR and the MODE CAM GEAR) to be driven by the said motor are mounted on the upper part of the capstan motor, that was a dead space in the conventional mechanisms hitherto available with a view to optimization of parts mounting layout. (Fig. 2-1 and Fig. 2-2.)

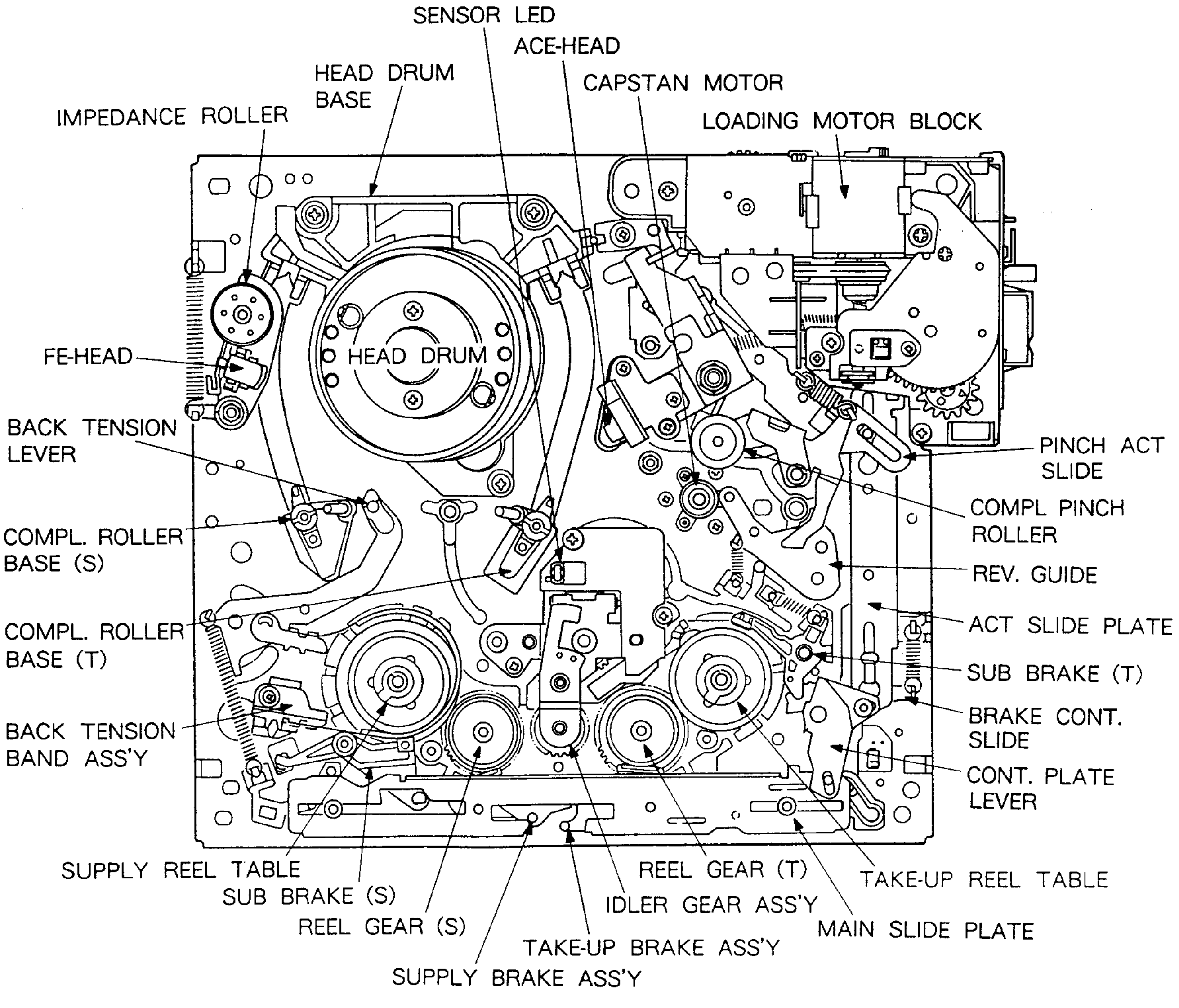

SENSOR LED
ACE-HEAD
HEAD DRUM BASE
CAPSTAN MOTOR
IMPEDANCE ROLLER
LOADING MOTOR BLOCK
HEAD DRUM
FE-HEAD
BACK TENSION LEVER
PINCH ACT SLIDE
COMPL PINCH ROLLER
COMPL. ROLLER BASE (S)
REV. GUIDE
COMPL. ROLLER BASE (T)
ACT SLIDE PLATE
SUB BRAKE (T)
BRAKE CONT. SLIDE
BACK TENSION BAND ASS'Y
CONT. PLATE LEVER
SUPPLY REEL TABLE
SUB BRAKE (S)
REEL GEAR (S)
REEL GEAR (T)
IDLER GEAR ASS'Y
TAKE-UP REEL TABLE
MAIN SLIDE PLATE
TAKE-UP BRAKE ASS'Y
SUPPLY BRAKE ASS'Y
FRONT

Fig. 2-1 TOP VIEW OF MECHANISM (INITIAL MODE)

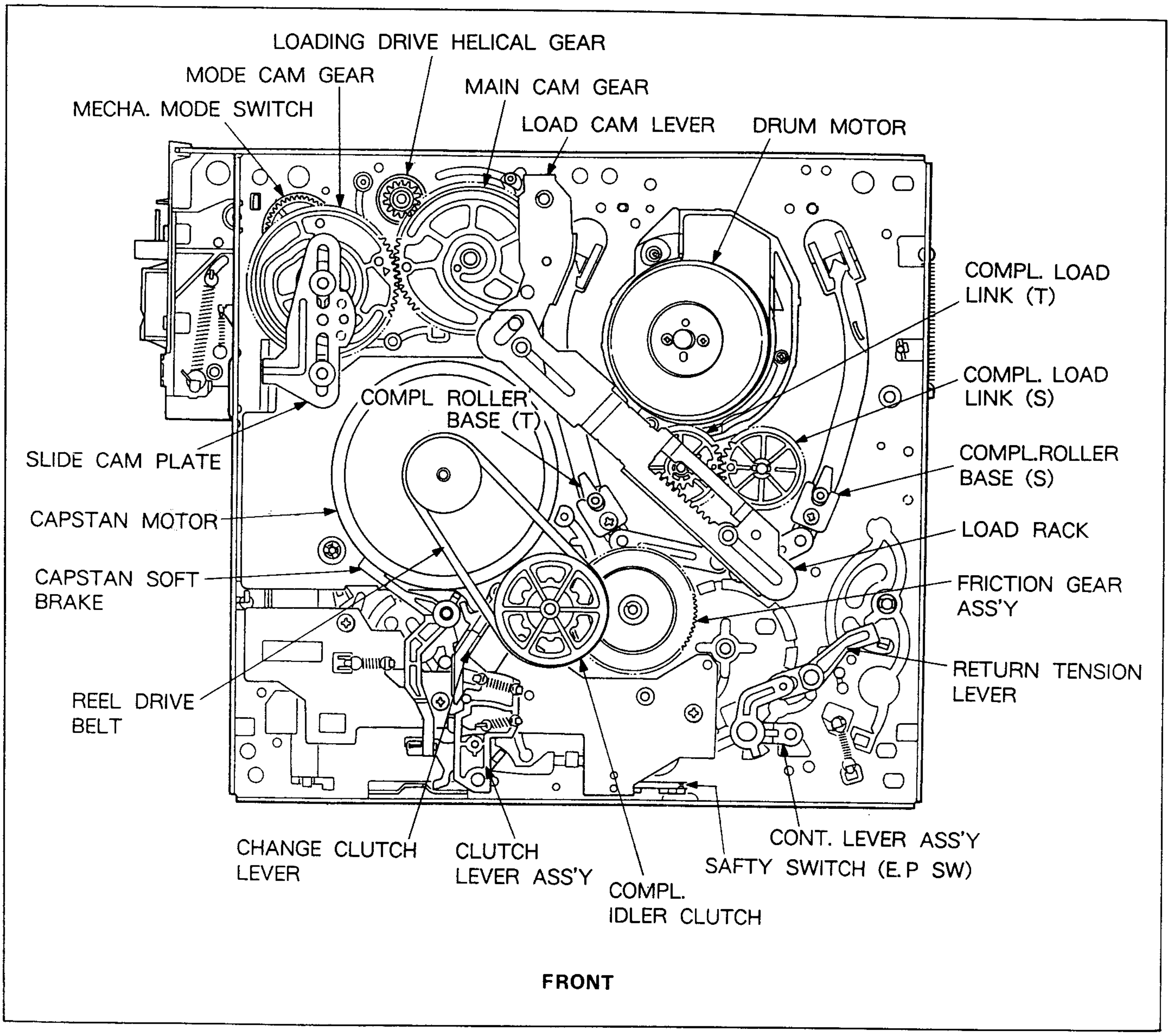

LOADING DRIVE HELICAL GEAR
MODE CAM GEAR
MAIN CAM GEAR
MECHA. MODE SWITCH
LOAD CAM LEVER
DRUM MOTOR
COMPL. LOAD LINK (T)
COMPL. LOAD LINK (S)
COMPL ROLLER BASE (T)
SLIDE CAM PLATE
COMPL.ROLLER BASE (S)
CAPSTAN MOTOR
LOAD RACK
CAPSTAN SOFT BRAKE
FRICTION GEAR ASS'Y
RETURN TENSION LEVER
REEL DRIVE BELT
CONT. LEVER ASS'Y
CHANGE CLUTCH LEVER
CLUTCH LEVER ASS'Y
SAFTY SWITCH (E.P SW)
COMPL. IDLER CLUTCH
FRONT

Fig. 2-2 BOTTOM VIEW OF MECHANISM (INITIAL MODE)

These two cams have one CAM GROOVE on both sides. A total of four CAM GROOVEs performs independent functions to meet the multi-function needs of these days by driving the elements of a wide variety of functions with the motor precisely controlled by a microcomputer.

The two cams are positive motion cams having a groove over 570 degrees. These cams cause the amount of lift to be changed by a mild gradient according to the angle of rotation while synchronizedly being rotated by an outer circumferential gear to alleviate the load exerted on the cams when driving the rod linked with the cams and also to ensure position stability in each mode of operation. The geometry of each cam and that of a metal fitting of the drive section are shown in Fig. 2-3 and Fig. 2-4, respectively. Also, the role of each cam used is described below.

On the GROOVE 3 side of MODE CAM GEAR have a small gear. This small gear is engaged with the MECHANISM MODE SWITCH as shown in Fig. 2-3., and detect the mechanism operation mode. In this way, the two cams and the MECHANISM MODE SWITCH are rotated synchronously, and the mechanism is fully synchronized and driven for each mode.

MAIN CAM GEAR :	CAM GROOVE 1. Pinch roller pressing operation CAM GROOVE 2. Tape loading mechanical drive
MODE CAM GEAR :	CAM GROOVE 3. Brake and clutch selecting operation CAM GROOVE 4. Brake control and front unloading control

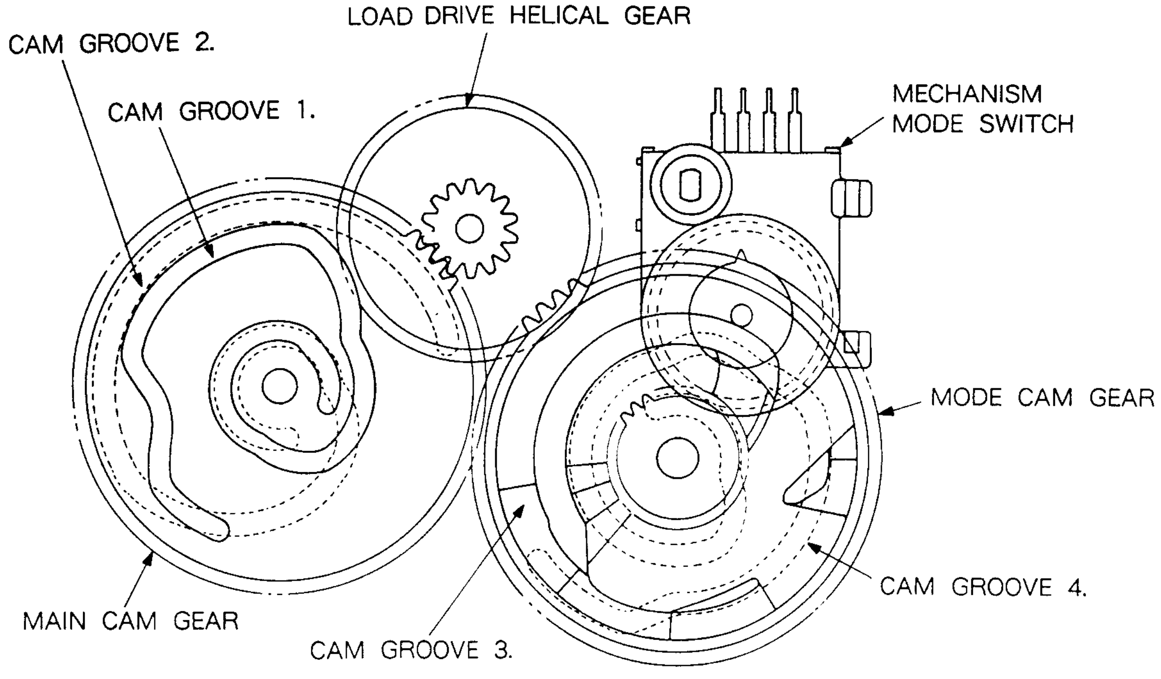


Fig. 2-3 PLAN OF CAMS CONSTRUCTION

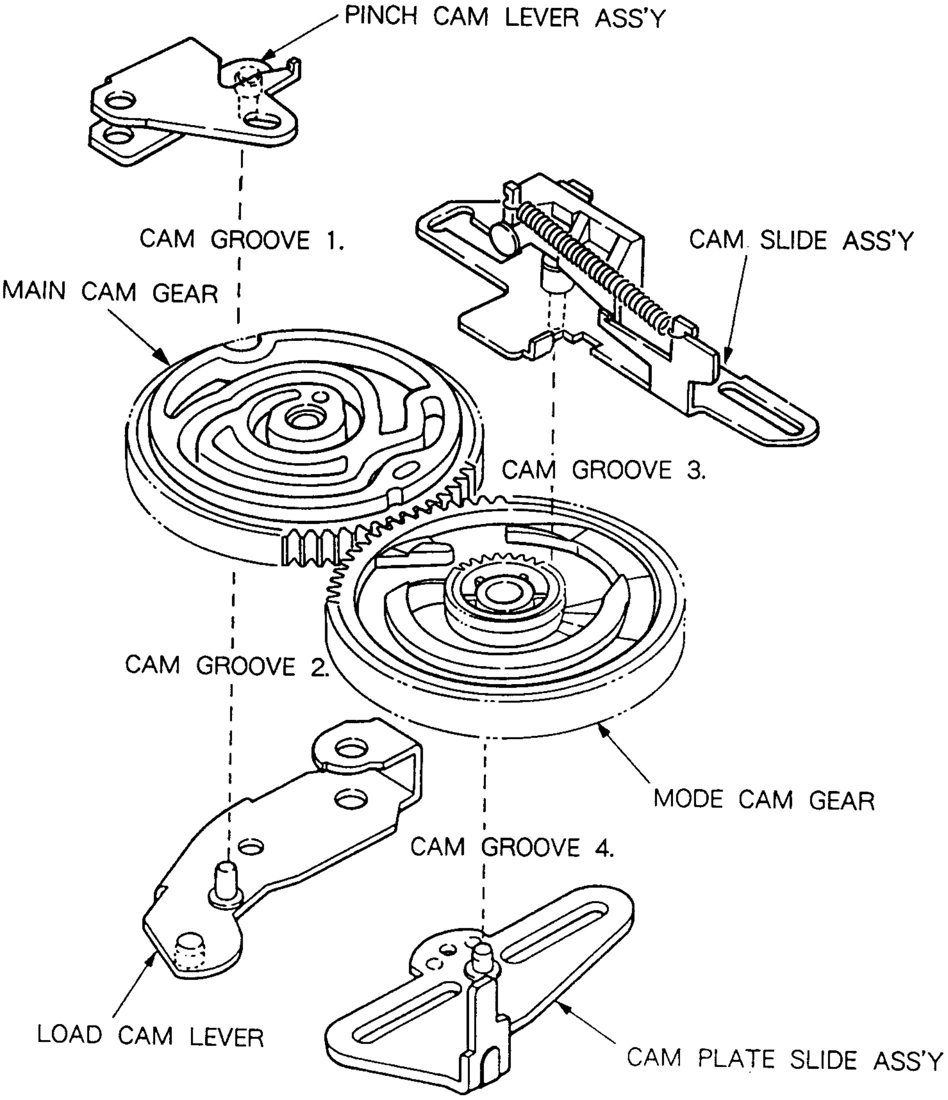

PINCH CAM LEVER ASS'Y
CAM GROOVE 1.
MAIN CAM GEAR
CAM SLIDE ASS'Y
CAM GROOVE 3.
CAM GROOVE 2.
MODE CAM GEAR
CAM GROOVE 4.
LOAD CAM LEVER
CAM PLATE SLIDE ASS'Y

Fig. 2-4 VIEW OF CAMS CONSTRUCTION

2-2-1. Tape Loading Mechanism

The tape loading mechanism is compactly designed with use of a LOAD RACK for loading by drive from the before-mentioned MAIN CAMs with CAM GROOVE 2. The LOAD RACK is laid on the dead space in between the DD capstan motor and the head motor for effective space utilization.(Fig. 2-5) The process from tape pull-out upon loading to contact of the leading guide section with the stopper of drum base and press-fitting under tension of spring is guided and driven in such a manner that the rod is drawn inward from the outer circumferential direction of the CAM GROOVE 2, thereby reducing the load torque (PV value) to the CAM GROOVE. And, the load of the loading motor is minimized to enhance reliability.

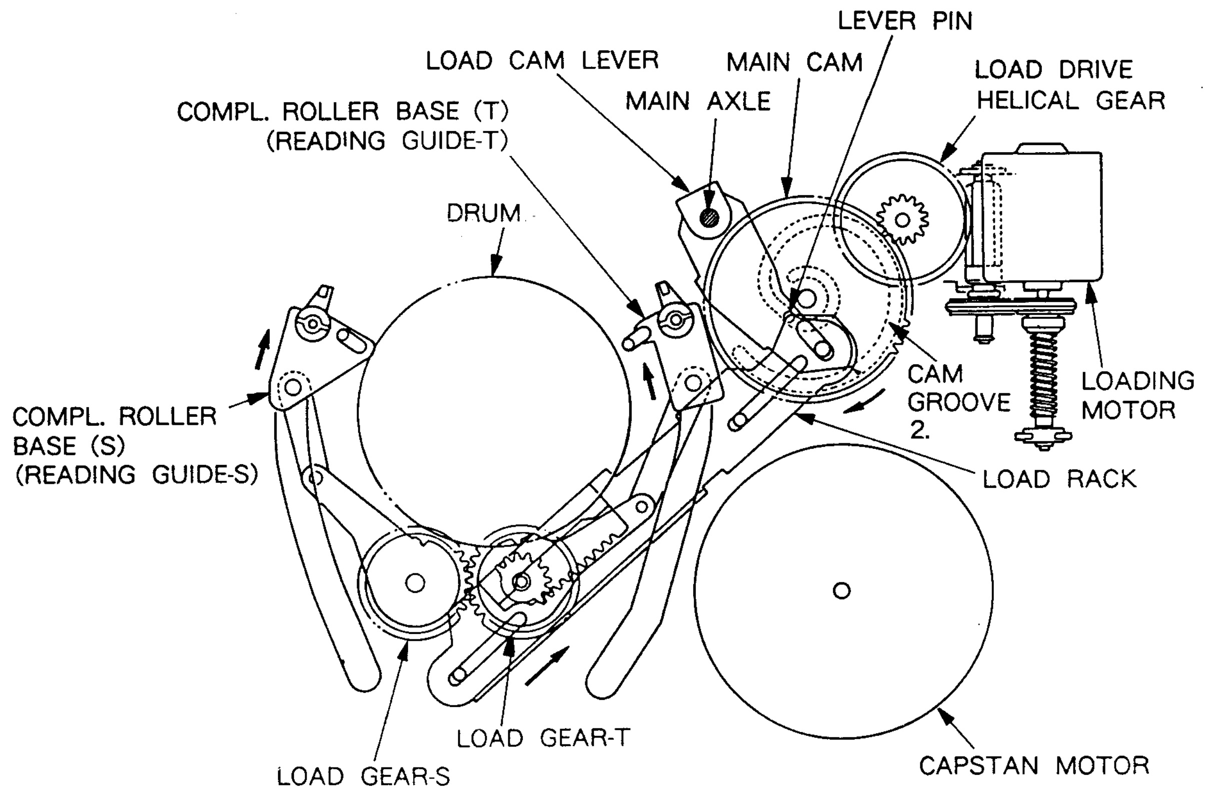

LEVER PIN
LOAD CAM LEVER
MAIN CAM
LOAD DRIVE HELICAL GEAR
MAIN AXLE
COMPL. ROLLER BASE (T) (READING GUIDE-T)
DRUM
COMPL. ROLLER BASE (S) (READING GUIDE-S)
CAM GROOVE 2.
LOADING MOTOR
LOAD RACK
LOAD GEAR-T
LOAD GEAR-S
CAPSTAN MOTOR

Fig. 2-5 CONSTRUCTION OF TAPE LOADING MECHANISM

2-2-2. Pinch Roller Pressing Mechanism

The PINCH LEVER assembly of the pinch roller is operated by the PINCH CAM LEVER (rod) driven by the CAM GROOVE 1 of the before-mentioned MAIN CAM, and then press-fitted to the capstan. The revolving tape guide (REV.GUIDE) is interlockingly operated with the PINCH LEVER assembly to ensure stable tape running at a fixed speed. (Fig. 2-6)

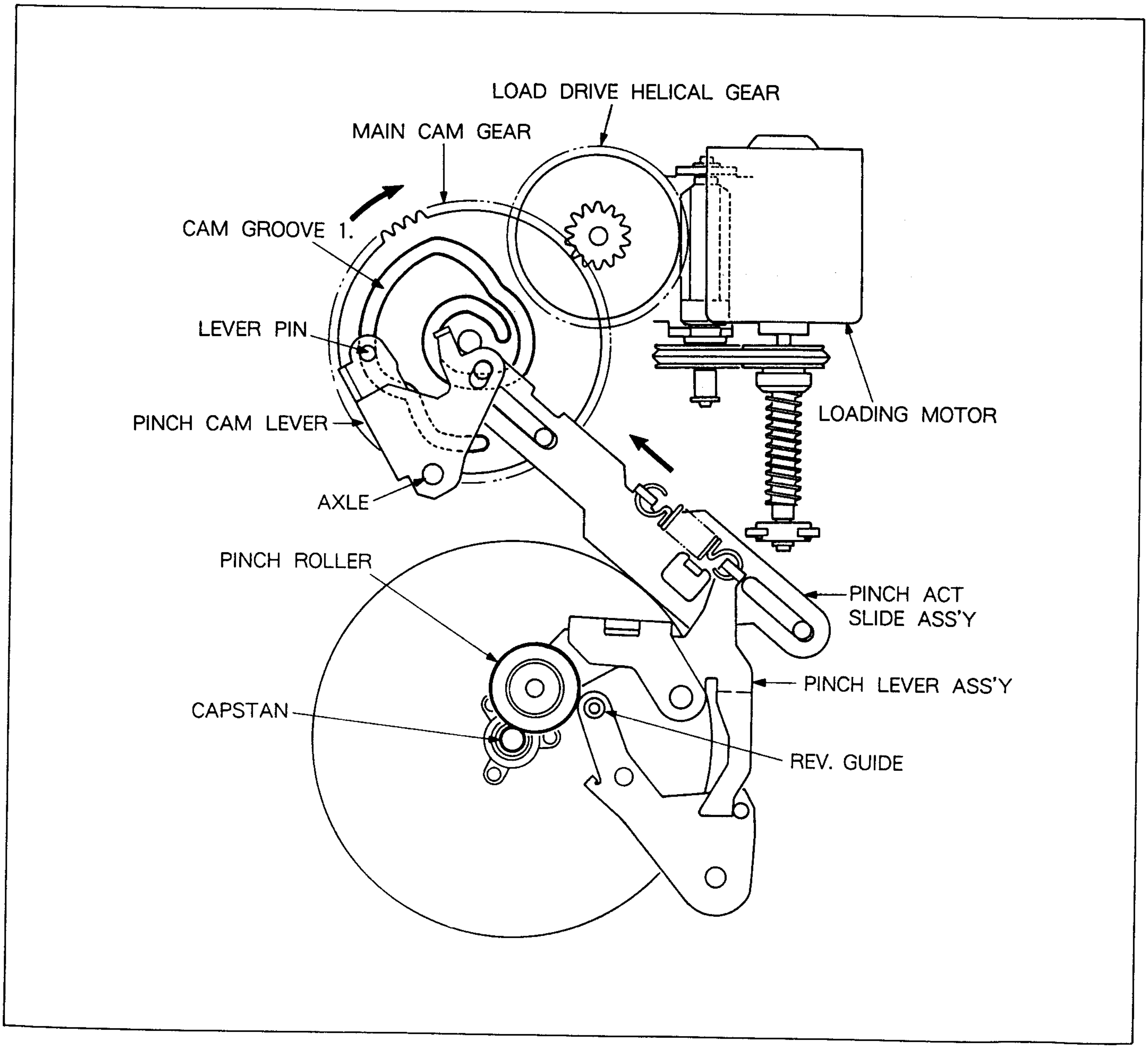

LOAD DRIVE HELICAL GEAR
MAIN CAM GEAR
CAM GROOVE 1.
LEVER PIN
PINCH CAM LEVER
AXLE
LOADING MOTOR
PINCH ROLLER
PINCH ACT SLIDE ASS'Y
PINCH LEVER ASS'Y
CAPSTAN
REV. GUIDE

Fig. 2-6 CONSTRUCTION OF PINCH ROLLER MECHANISM

2-2-3. Operation of Brake Control Plate

The ACT SLIDE PLATE and the MAIN SLIDE PLATE shown in Fig. 2-7 is driven by the CAM GROOVE 4 of the MODE CAM GEAR for precise control of operations including the control of back tension lever, auxiliary brake (SUB BRAKE S/T), main brake (SUPPLY BRAKE and TAKE-UP BRAKE), clutch selection, and drive selection of front loading mechanism.

Also, the mechanism mode switch is engaged with the small gear of the MODE CAM GEAR for sync rotation. At the time, the detection position of each mode is set so that it becomes the flat section at the cam curve of the CAM GROOVE 4 of the MODE CAM GEAR. So, even if motor stop time deviation occurs due to the load following the detection of the loading motor stop position, the control plate linked with a stop in the specified position.

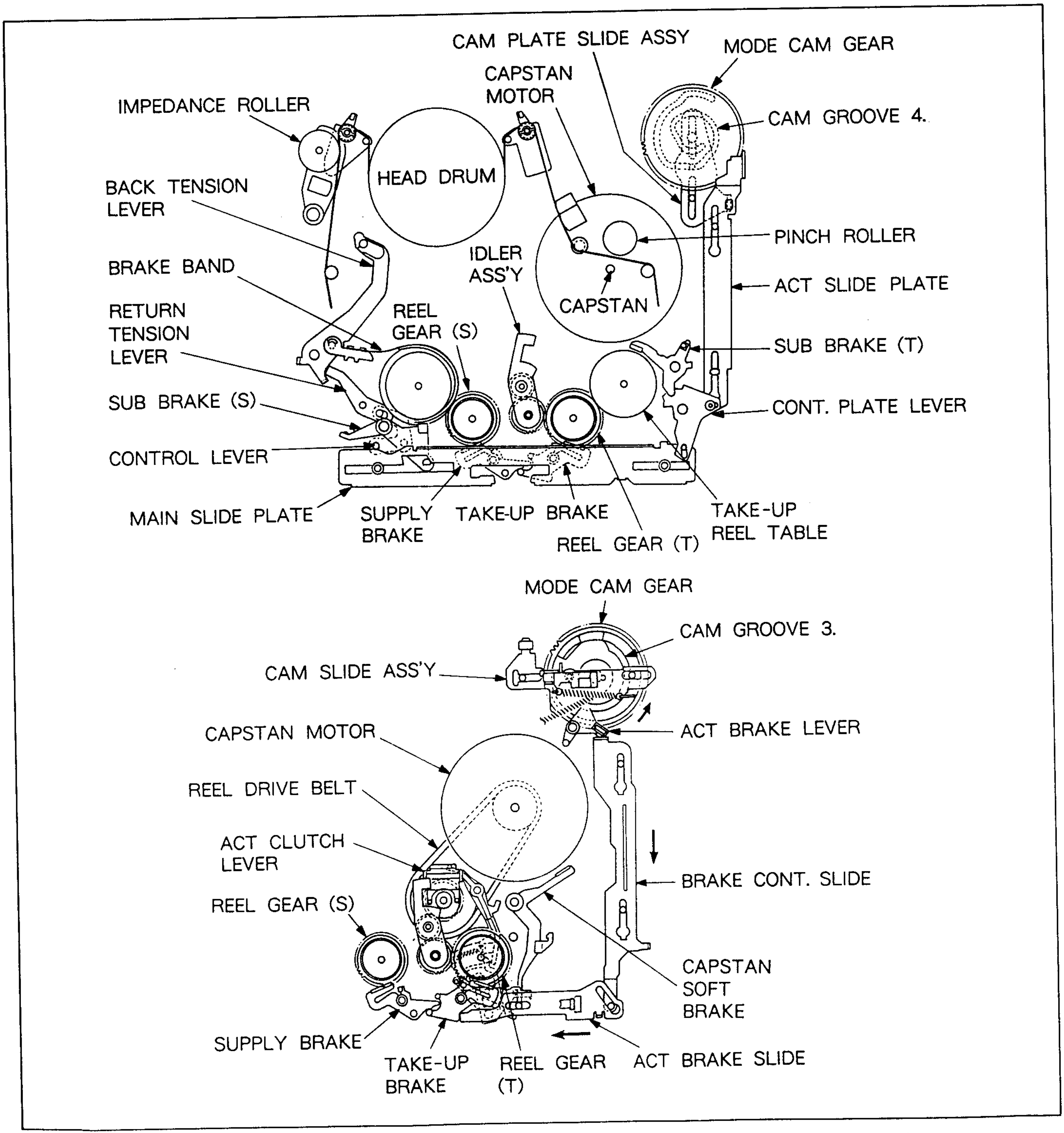

CAM PLATE SLIDE ASSY
MODE CAM GEAR
CAPSTAN MOTOR
IMPEDANCE ROLLER
CAM GROOVE 4.
HEAD DRUM
BACK TENSION LEVER
PINCH ROLLER
BRAKE BAND
IDLER ASS'Y
ACT SLIDE PLATE
RETURN TENSION LEVER
REEL GEAR (S)
CAPSTAN
SUB BRAKE (T)
SUB BRAKE (S)
CONT. PLATE LEVER
CONTROL LEVER
MAIN SLIDE PLATE
SUPPLY BRAKE
TAKE-UP BRAKE
REEL GEAR (T)
TAKE-UP REEL TABLE
MODE CAM GEAR
CAM GROOVE 3.
CAM SLIDE ASS'Y
CAPSTAN MOTOR
ACT BRAKE LEVER
REEL DRIVE BELT
ACT CLUTCH LEVER
BRAKE CONT. SLIDE
REEL GEAR (S)
CAPSTAN SOFT BRAKE
SUPPLY BRAKE
TAKE-UP BRAKE
REEL GEAR (T)
ACT BRAKE SLIDE

Fig. 2-7 CONSTRUCTION OF BRAKE CONTROL PLATE (AT REW/FF, STOP MODE)

2-2-4. Brake Control Mechanism

The mechanical logic of the brake state is shown in Fig. 2-8. The brake which damps the reel rotation is operated by the BRAKE CONTROL SLIDE driven from the CAM GROOVE 3 of the MODE CAM GEAR.

Also, to alleviate damage to the tape caused by high tension of the brake in operation, the tape is stopped after brake operation and the shape is thoughtfully designed for proper biting-in ratio of the left and the right brakes after-mentioned to each other.
This enables the supply brake to be released by the operation of the above-mentioned MAIN SLIDE PLATE after an elapse of prefixed slight time to reduce the tape tension to zero, and to provide the tape with a proper degree of looseness. As a result, a slight gap is created in the tape from the HEAD DRUM.

Further, a momentary still mechanism which dispenses with use of a plunger solenoid is not provided as one of design features of the P-90 mechanism.
To stabilize the image in an extremely short period of time during a shift to the STILL mode from the PLAY mode, the auxiliary brake (CAPSTAN SOFT BRAKE) is press-fit to the outer circumference of the capstan motor by the before-mentioned CAM GROOVE 3 of the MODE CAM GEAR.
These operations is interlocked with the operation of the before-mentioned ACT SLIDE PLATE and the MAIN SLIDE PLATE. It consists of one MODE CAM for offsetting the operating position.

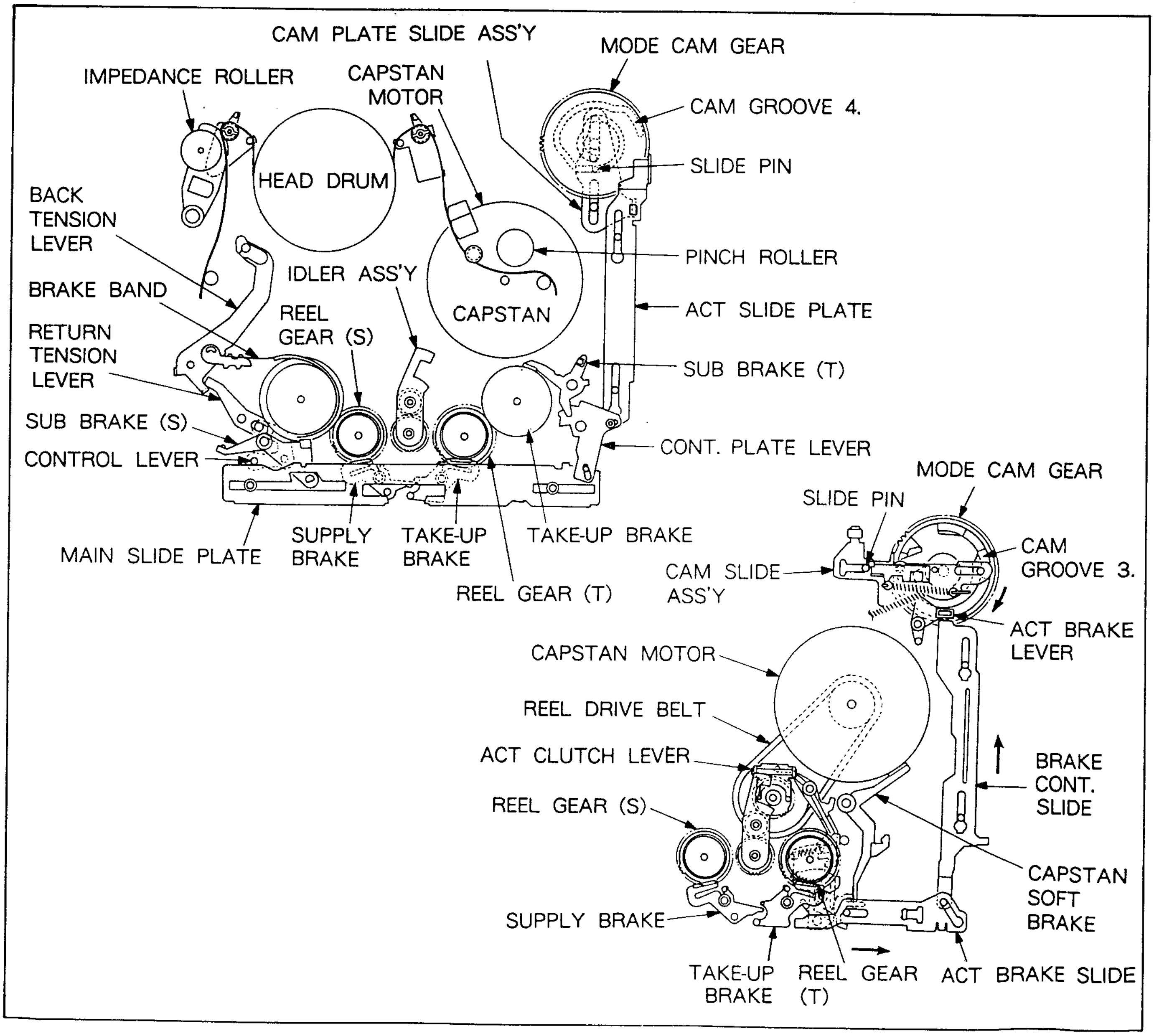
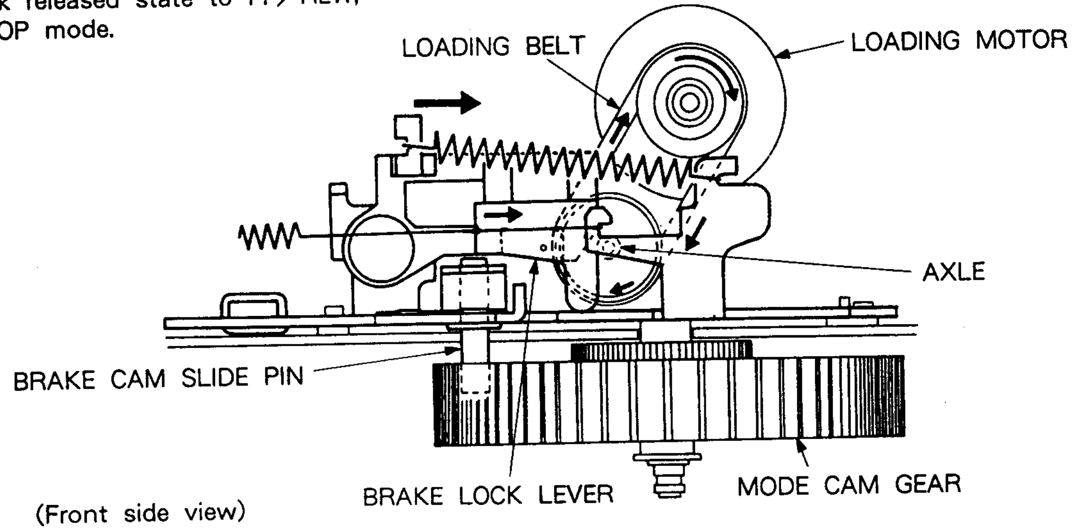

CAM PLATE SLIDE ASS'Y
MODE CAM GEAR
IMPEDANCE ROLLER
CAPSTAN MOTOR
CAM GROOVE 4.
SLIDE PIN
HEAD DRUM
BACK TENSION LEVER
PINCH ROLLER
IDLER ASS'Y
BRAKE BAND
REEL GEAR (S)
CAPSTAN
ACT SLIDE PLATE
RETURN TENSION LEVER
SUB BRAKE (T)
SUB BRAKE (S)
CONT. PLATE LEVER
CONTROL LEVER
MODE CAM GEAR
SLIDE PIN
MAIN SLIDE PLATE
SUPPLY BRAKE
TAKE-UP BRAKE
TAKE-UP BRAKE
REEL GEAR (T)
CAM SLIDE ASS'Y
CAM GROOVE 3.
ACT BRAKE LEVER
CAPSTAN MOTOR
REEL DRIVE BELT
ACT CLUTCH LEVER
BRAKE CONT. SLIDE
REEL GEAR (S)
CAPSTAN SOFT BRAKE
SUPPLY BRAKE
TAKE-UP BRAKE
REEL GEAR (T)
ACT BRAKE SLIDE

Fig. 2-8 CONSTRUCTION OF BRAKE CONTROL PLATE (AT BRAKE MODE)

2-2-5. Brake Lock Release Mechanism (FF/REW→STOP Mode)

The brake lock momentary release mechanism is shown in Fig. 2-9 ⓐ, ⓑ and Fig. 2-10.
In the FF/REW mode (Fig. 2-9 ⓐ) mechanical elastic load is given to the BRAKE LOCK LEVER mounted on the BRAKE CAM SLIDE which causes the brake to operate, and it is locked to the high-speed rotary axle of the 1st reducing section of the loading motor.

ⓐ changes from brake mode or lock released state to FF/REW, STOP mode.

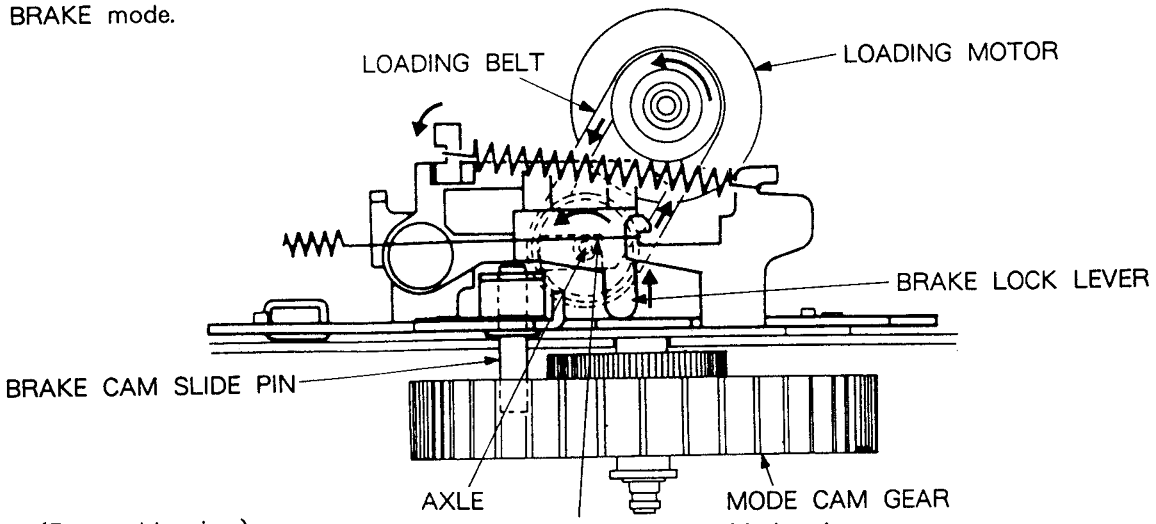

LOADING BELT
LOADING MOTOR
AXLE
BRAKE CAM SLIDE PIN
BRAKE LOCK LEVER
MODE CAM GEAR

(Front side view)

Fig. 2-9 ⓐ BRAKE LOCK & RELEASE MECHANISM

At the time of a shift to the STOP mode from the FF/REW (Fig. 2-9 ⓑ), the BRAKE LOCK LEVER releases the lock on slight rotation of the axle by contact between the rotary shaft and the friction resistance so that the brake can be instantaneously applied to the reel. The lock release speed is almost the same as the start-up of the loading motor. So, the its response to the brake is very quick, and construction is simplified also.

ⓑ Changes from FF/REW, STOP mode to BRAKE mode.


LOADING BELT
LOADING MOTOR
BRAKE LOCK LEVER
BRAKE CAM SLIDE PIN
AXLE
MODE CAM GEAR

(Front side view)

Lock is released by the frictional resistance of an elastic load.

Fig. 2-9 ⓑ BRAKE LOCK & RELEASE MECHANISM

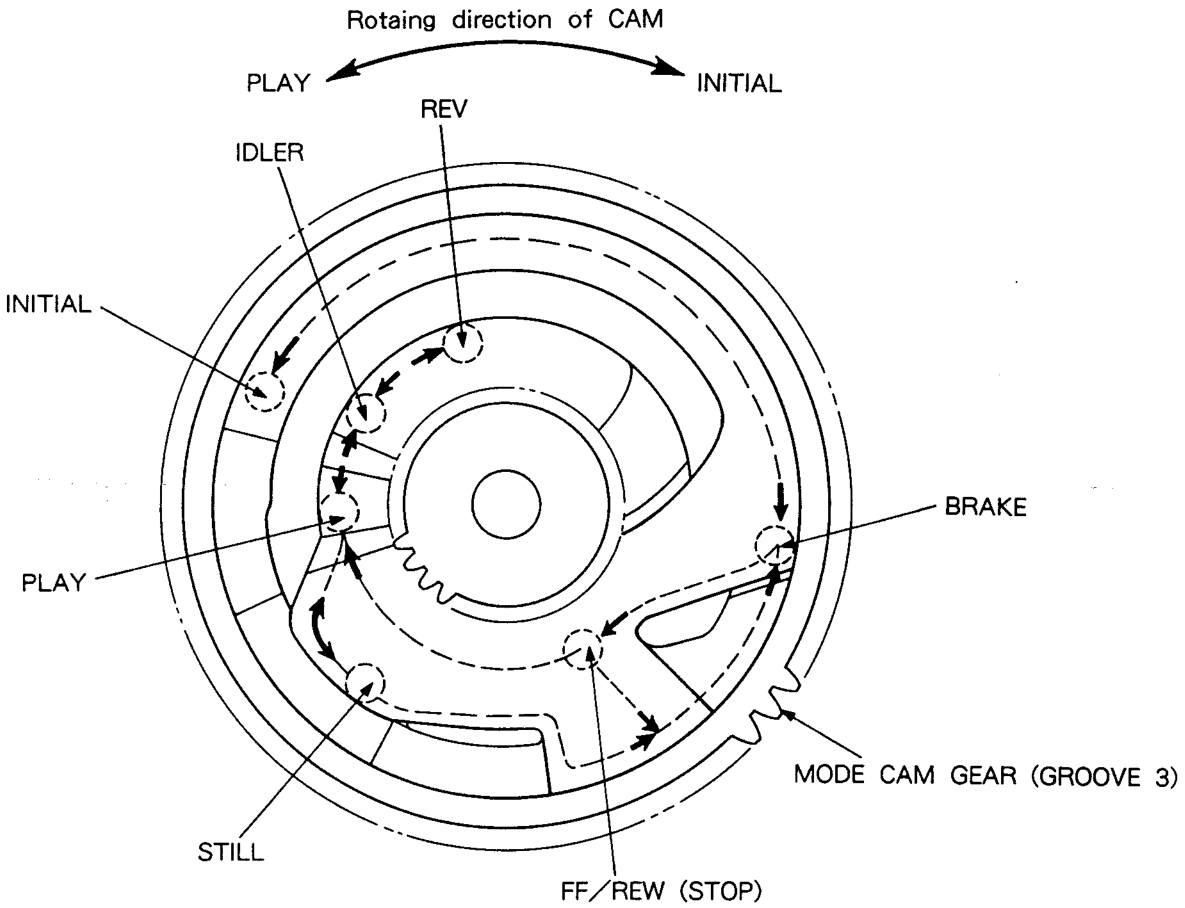

Rotaing direction of CAM
PLAY
INITIAL
REV
IDLER
INITIAL
BRAKE
PLAY
MODE CAM GEAR (GROOVE 3)
STILL
FF/REW (STOP)

Fig. 2-10 **POSITIONING OF BRAKE CAM SLIDE-PIN ON THE GROOVE 3 OF MODE CAM GEAR**

2-3. REEL TABLE DRIVE

2-3-1. Reel Table Drive Mechanism

This mechanism employs the system of driving the tape from the DD capstan motor via rubber belt. In the tape constant speed running mode for PLAY, F-SEARCH, and R-SEARCH, the capstan and the pinch roller are press-fitted to allow the tape to run at a constant speed. By providing a FRICTION MECHANISM in between the capstan motor and the reel table, the tape is taken up. In the FF/REW tape high-speed take-up mode, the capstan and the pinch roller are separated from each other, and the capstan motor and the reel table are linked direct by the clutch mechanism to carry out tape take-up. Also, to realize a thin type reel table drive section, the mechanism is simplified and the rotary parts are thinned for realization of physically compact design, and a step is provided on the reel table mounting section of the chassis by high-precision drawing process. A simplified figure of the drive mechanism is shown in Fig. 2-11 and Fig. 2-12. Power transmission to the pulley of the clutch mechanism section is done from the DD capstan motor via rubber belt.

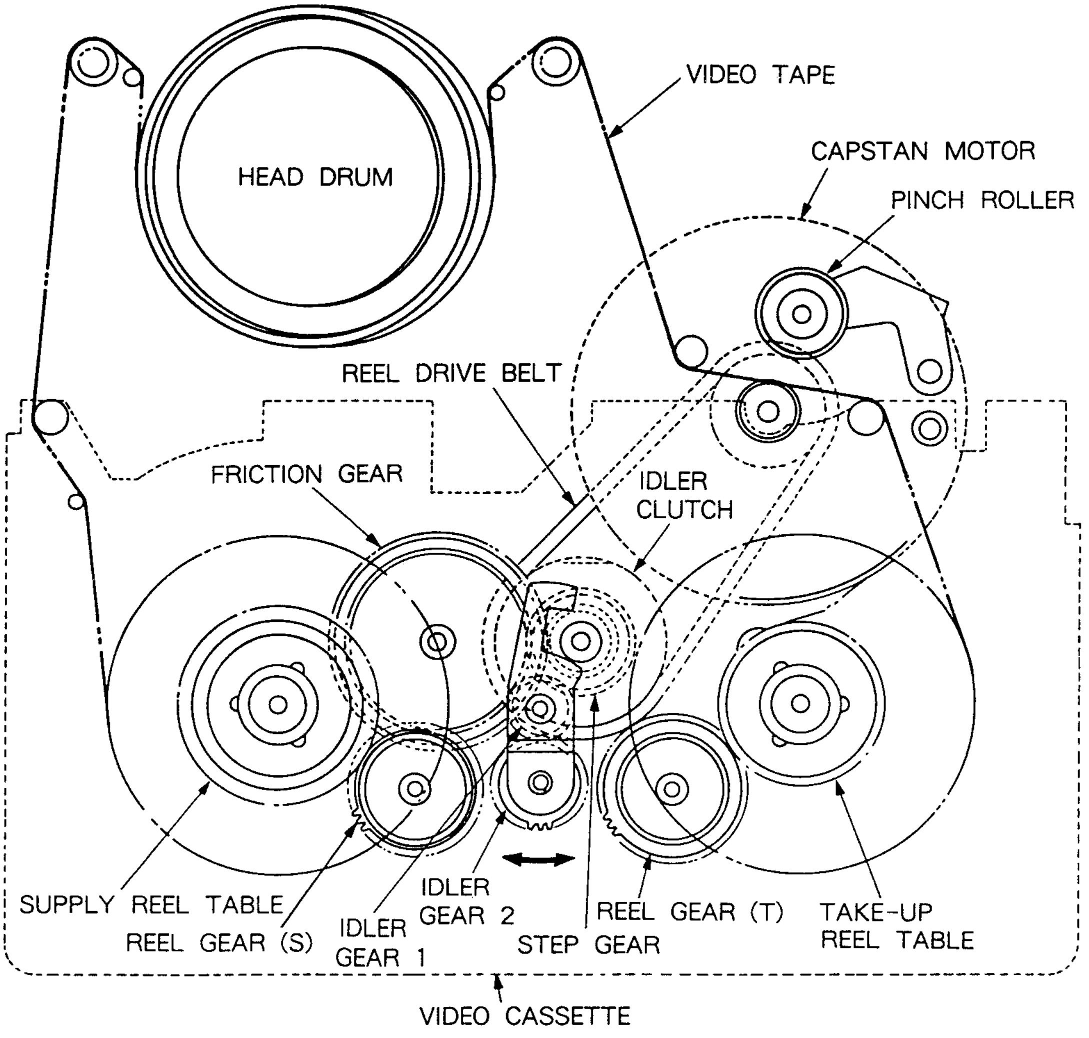
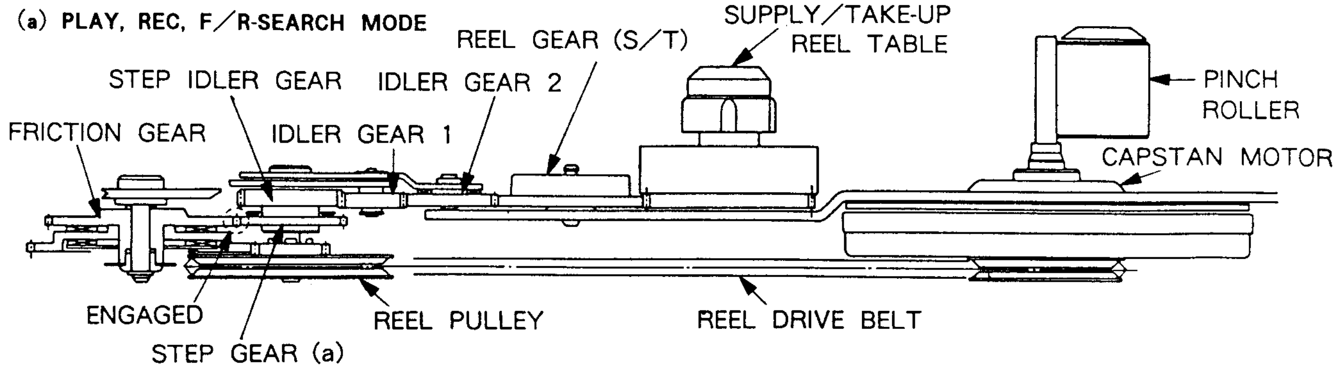

VIDEO TAPE
CAPSTAN MOTOR
PINCH ROLLER
HEAD DRUM
REEL DRIVE BELT
FRICTION GEAR
IDLER CLUTCH
SUPPLY REEL TABLE
REEL GEAR (S)
IDLER GEAR 1
IDLER GEAR 2
STEP GEAR
REEL GEAR (T)
TAKE-UP REEL TABLE
VIDEO CASSETTE

Fig. 2-11 REEL TABLE DRIVE

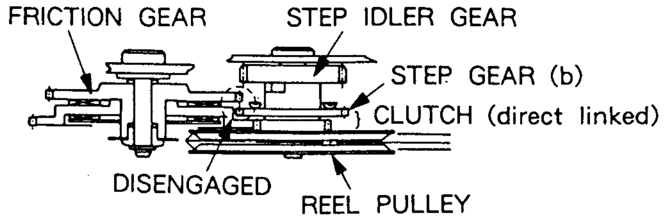
At that time, the reel table winding speed and the torque needed in a wide variety of modes are obtained by shifting the up and down STEP GEAR positioned at the upper section of pulley. The selection of the STEP GEAR is precision controlled by the MODE CAM GEAR via the BRAKE CONTROL SLIDE. With the up and down STEP GEAR down, the clutch mechanism is direct linked, and the transmission power from the capstan motor is sent to the reel table via IDLER GEAR assembly and REEL GEAR (S/T). On the other hand, FRICTION MECHANISM acts between the pulley and the STEP GEAR when the up and down STEP GEAR are in the elevated state, thereby controlling the transmission torque for generation of the take-up slip. Normally, it is desirable that the take-up torque of the reel table is higher in the R-SEARCH mode than that in the PLAY mode. This is because in the forward tape running the tape winding load to the HEAD DRUM has to be taken care of the capstan and the pinch roller.
While, in the reverse tape running mode the winding load has to be taken on the take-up reel table. In the special playback operation, a mechanism for varying the take-up torque of the reel table is required to be changed depending upon the running direction of the tape. But in this mechanism, the torque selection is made by varying the reduction speed ratio up to the reel table from the capstan motor on both the forward side and the reverse side of the tape. Also, design simplification of the selection mechanism is realized by using a single friction mechanism. In other words, the take-up torque necessary for forward/reverse rotation is obtained by controlling the capstan motor speed.
Rotation speed and torque needed for each mode of operation are converted by clutch mechanism for transmission of the drive power to the idler mechanism. The left and right moving IDLER GEAR assembly is automatically rotated to the left and the right according to the direction of capstan motor rotation by using the friction force. Because the mechanism is so designed as to drive the reel table of the side on which the tape is transported by the capstan and pinch roller, the forward and reverse constant speed drive (the PLAY, REC, F/R SEARCH modes) is carried out in the state in which the FRICTION MECHANISM is being operated (Fig. 2-12 ⓐ) On the other hand, in the condition in which the friction mechanism is not in operation, the forward/reverse high speed drive (FF/REW mode) is made possible (Fig. 2-12 ⓑ). Also, the reel drive in all modes is taken care of by the single left and right moving idler for design simplification.

The idler body employs gear drive to improve reliability with a view to realizing parts thinning while securing the transmission reliability. Using a resin molded gear as material of an idler, the efficiency of the entire reel drive system has been improved because there are no deformation and loss, and minimized rotation moving torque necessary for biting-in as in the case of a material such as rubber which shows considerable elastic deformation, etc. Further in this mechanism, an intermediate gear is provided in between the reel side and the idler to minimize the rotating and moving angle of the left and right moving idlers, thereby holding the reversing time to a minimum when shifting to the tape running direction change mode. This results in significantly reduced possibility of tape looseness.

(a) PLAY, REC, F/R-SEARCH MODE



(b) F-FWD/REW, STOP MODE



(a) The clutch mechanism is disengaged, and rorational force is transmitted through the friction mechanism. (Constant speed rotating mode)

(b) Direct transmission is obtained by disengaging the friction mechanism with a clutch mechanism. (High-speed rotating mode)

Fig. 2-12 REEL TABLE DRIVE (SIDE VIEW)

2-3-2. Reel Table Drive Clutch Lock and Release Mechanism

As described in the preceding section, using the selection of the step gear (CLUTCH MECHANISM), two mechanisms which are driven by being selected via direct drive or via FRICTION MECHANISM from the capstan motor, to execute the reel table drive. The operating status of the clutch lock and the releasing mechanism is shown in Fig. 2-13.

Fig. 2-13 ① shows the tape unloading position (INITIAL position) when the power for the mechanism operating mode is switched off.

At that times all the levers are in the initial positions, and the clutch is released also so that a route for reel table drive is created via a friction mechanism.

Fig. 2-13 ② shows that the mechanism operation mode has executed the tape loading and that it has completed its movement to the STOP (stand-by), FF/REW position.

At this time, the CLUTCH ACT LEVER is operated by the hook of the ACT BRAKE SLIDE to move the ACT CLUTCH LEVER in the direction of arrow via the CLUTCH LEVER and the CLUTCH CHANGE LEVER. Now, the up and down STEP GEAR is placed into the direct coupled state. In the FF/REW mode, the reel table is directly driven so that the rotation of the capstan motor is directly transmitted to make high-speed rotation drive possible. When shifting the mode to the STOP from the FF/REW in this condition, the mechanism mode position is once moved back to the brake position, and when the reel table brake is instantaneously applied, the clutch is released once at the same time, after which it returns to the same mechanism mode as the FF/REW mode once again. Now, it is placed in a waiting state in the same condition of the STOP mode as shown in Fig. 2-13 ②.

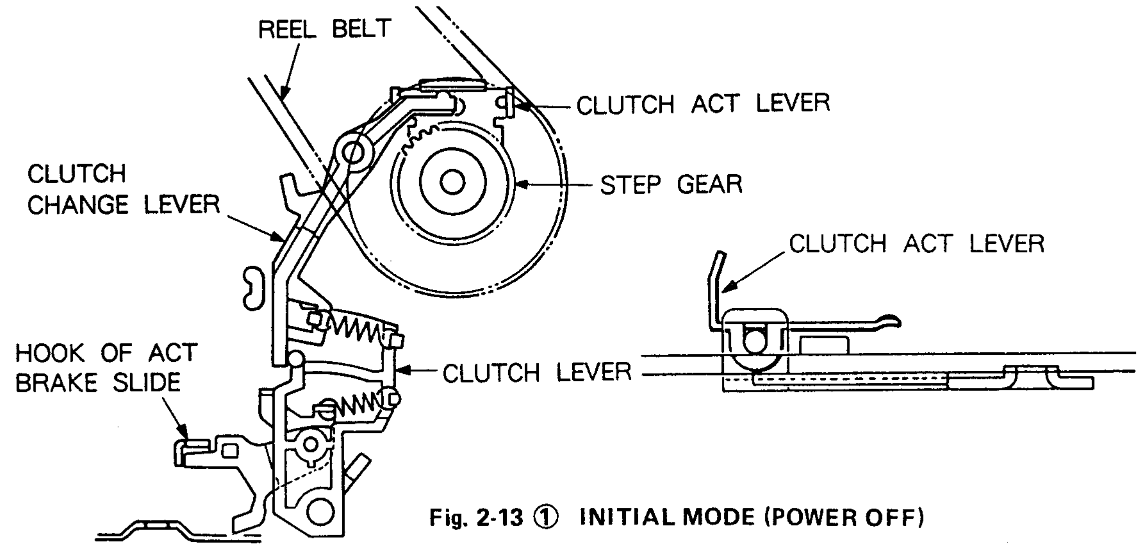

REEL BELT
CLUTCH ACT LEVER
STEP GEAR
CLUTCH CHANGE LEVER
CLUTCH ACT LEVER
HOOK OF ACT BRAKE SLIDE
CLUTCH LEVER

Fig. 2-13 ① INITIAL MODE (POWER OFF)

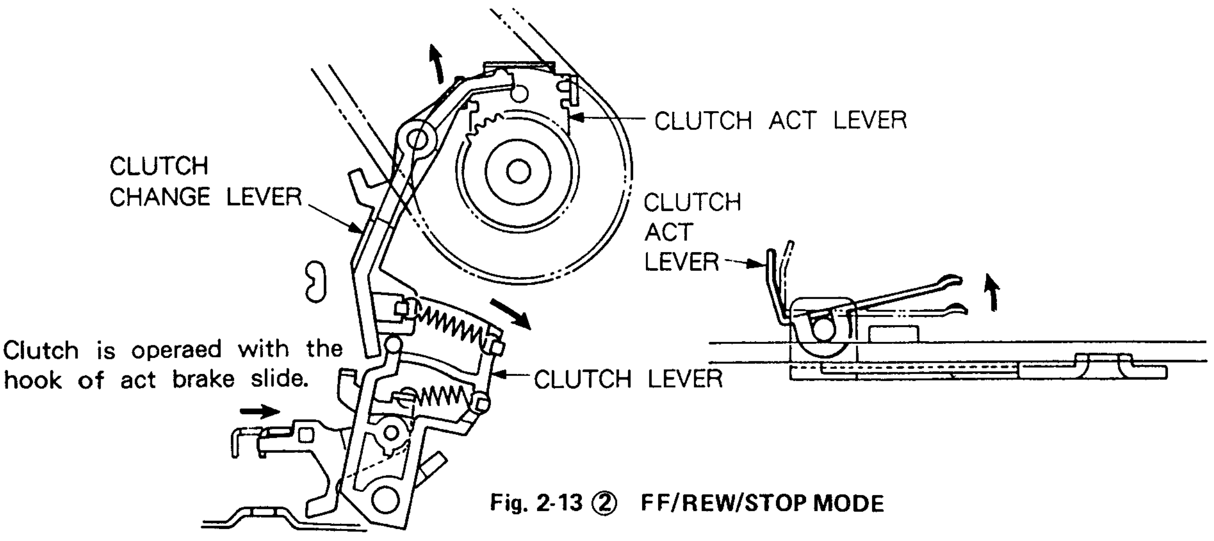

CLUTCH ACT LEVER
CLUTCH CHANGE LEVER
CLUTCH ACT LEVER
Clutch is operaed with the hook of act brake slide.
CLUTCH LEVER

Fig. 2-13 ② FF/REW/STOP MODE

Fig. 2-13 ① – ③ REEL TABLE DRIVE CLUTCH LOCK AND RELEASE MECHANISM

Fig. 2-13 ③ shows the completion state of a shift to the PLAY mode via the STILL mode from the STOP (FF/REW) mode for the mechanism mode position.

In the case of this mode shifting, the movement of the BRAKE ACT SLIDE remains fixed. So, the CLUTCH ACT LEVER should be unlocked by the movement of the hook of the MAIN SLIDE PLATE to cause the clutch to be released. This movement in turn causes the capstan motor rotation to be transmitted via the friction mechanism. So, the constant speed rotation drive necessary for the PLAY (REC) mode and SEARCH mode is made possible.

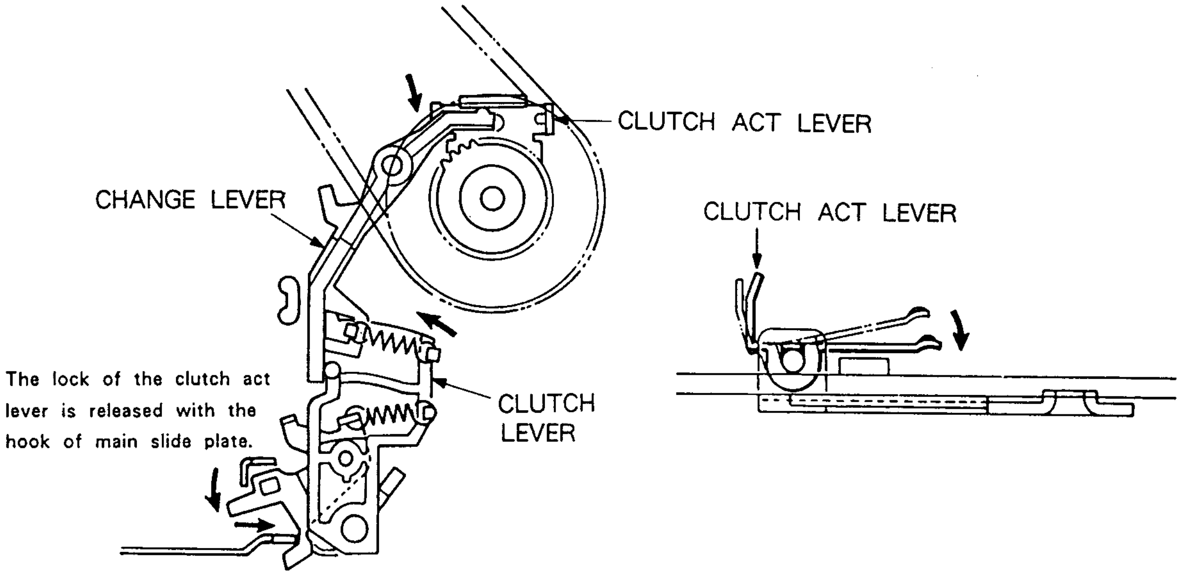

CLUTCH ACT LEVER
CHANGE LEVER
CLUTCH ACT LEVER
The lock of the clutch act lever is released with the hook of main slide plate.
CLUTCH LEVER

Fig. 2-13 ③ FF/REW/STOP MODE → STILL MODE → PLAY MODE

2-4. FRONT LOADING DRIVE SELECTION MECHANISM

In the P-90 mechanism, the motor dedicated to the use of front loading is not employed. The drive source is utilized instead of the tape loading motor. As shown in Fig. 2-14 ⓐ/ⓑ, during the front loading the FRONT LOAD WORM GEAR directly coupled to the tape loading motor axle and the FRONT HELICAL GEAR with several teeth missing are engaged with each other and rotated for transmission of the drive force to the front loading mechanism. When the cassette tape is inserted completely in the mechanism, the FRONT HELICAL GEAR is automatically disengaged from the FRONT LOAD WORM GEAR. After that, the tape loading operation is performed without the tape loading motor drive force being transmitted to the front loading mechanism.

While the drive force is being transmitted to the front loading mechanism, the CAM GROOVEs of the before-mentioned MAIN CAM GEAR and the MODE CAM GEAR are flat in cam line pattern. These are therefore held without changing the mode state of the mechanism in any way.

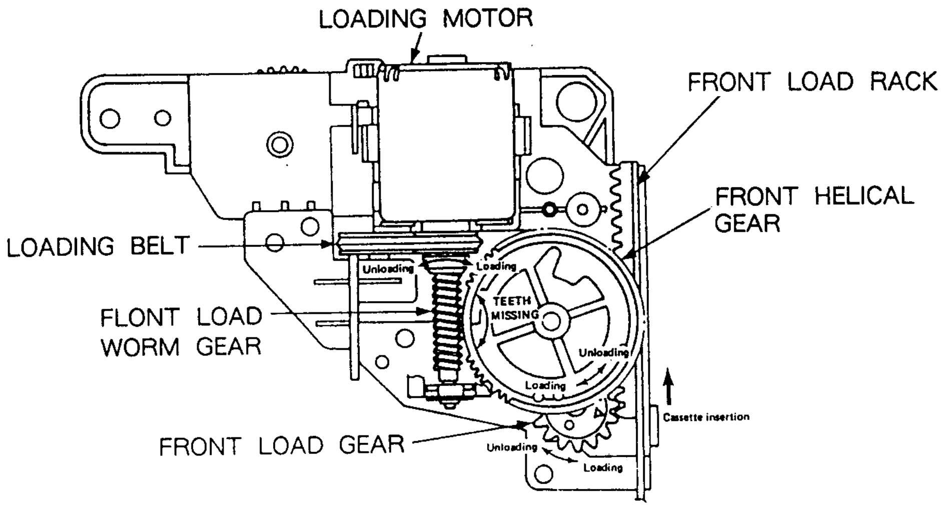

LOADING MOTOR
FRONT LOAD RACK
FRONT HELICAL GEAR
LOADING BELT
FLONT LOAD WORM GEAR
FRONT LOAD GEAR
Unloading
Loading
TEETH MISSING
Unloading
Loading
Cassette insertion
Unloading
Loading

Fig. 2-14 ⓐ FRONT LOADING DRIVE SELECTION MECHANISM (CASSETTE INSERTED POSITION)

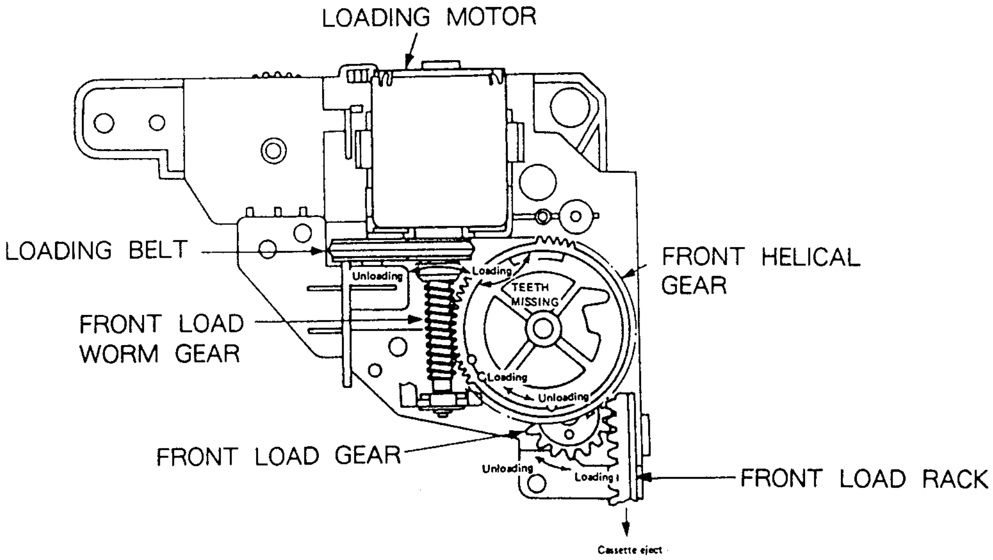

LOADING MOTOR
LOADING BELT
FRONT LOAD WORM GEAR
FRONT HELICAL GEAR
Unloading
Loading
TEETH MISSING
Loading
Unloading
FRONT LOAD GEAR
Unloading
Loading
FRONT LOAD RACK
Cassette eject

Fig. 2-14 ⓑ FRONT LOADING DRIVE SELECTION MECHANISM (CASSETTE EJECTED POSITION)

(A) Cassette inserting operation

When inserting a cassette from the cassette ejected state of Fig. 2-14 ⓑ, the FL START SWITCH shown in Fig. 2-15 is turned OFF, to cause the loading motor to be rotated in the direction of insetting. As a result, the FRONT LOAD RACK is drawn in, and the front loading is made up to the cassette tape completion point. So, it is locked in the grooves shown in Fig. 2-15 to complete cassette inserting. At that time, the FRONT HELICAL GEAR is positioned at ⓐ of Fig. 2-14, and is released from the front loading mechanism, therefore, the tape loading operation is continuously performed.

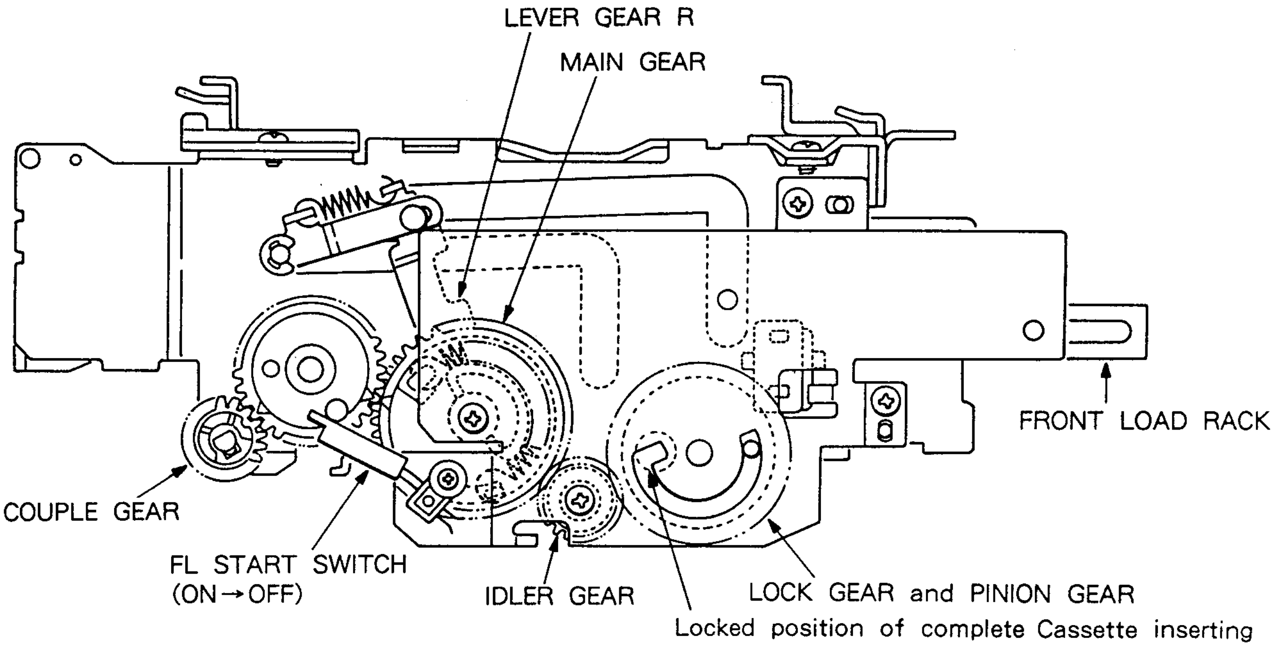

LEVER GEAR R
MAIN GEAR
FRONT LOAD RACK
COUPLE GEAR
FL START SWITCH
(ON→OFF)
IDLER GEAR
LOCK GEAR and PINION GEAR
Locked position of complete Cassette inserting

Fig. 2-15 CASSETTE HOLDER MECHANISM (CASSETTE INSERTING OPERATION)

(B) Cassette ejection operation

The components of the front loading mechanism is shown in Fig. 2-16.

When ejecting the cassette from the inserted state shown in Fig. 2-14 ⓐ, the FRONT ACT LEVER is pushed in the direction of arrow due to the ACT SLIDE PLATE moves in the direction of arrow shown in Fig. 2-17. As a result, the FRONT LEVER assembly is turned counterclockwise via the FRONT LOAD SLIDE to cause the FRONT HELICAL GEAR to be engaged with the FRONT LOAD WORM GEAR of the loading motor. At that time, the loading motor is being rotated counterclockwise, so that the FRONT HELICAL GEAR is caused to be rotated counterclockwise also to carry out the front unloading via the FRONT LOAD GEAR and the FRONT LOAD RACK. At the same time, the FRONT ACT LEVER is operated counterclockwise by the hook of the FRONT HELICAL GEAR. This releases the lock being pushed in the direction of arrow indicated by the ACT SLIDE PLATE. So, the FRONT LOAD SLIDE assembly now moves to the initial position to prepare for the next ejection operation. Incidentally, the movement of the FRONT LEVER assembly performs an important function of positioning the FRONT HELICAL GEAR (Fig. 2-14 ⓐ) upon completion of cassette mounting, in addition to the cassette eject start-up operation.

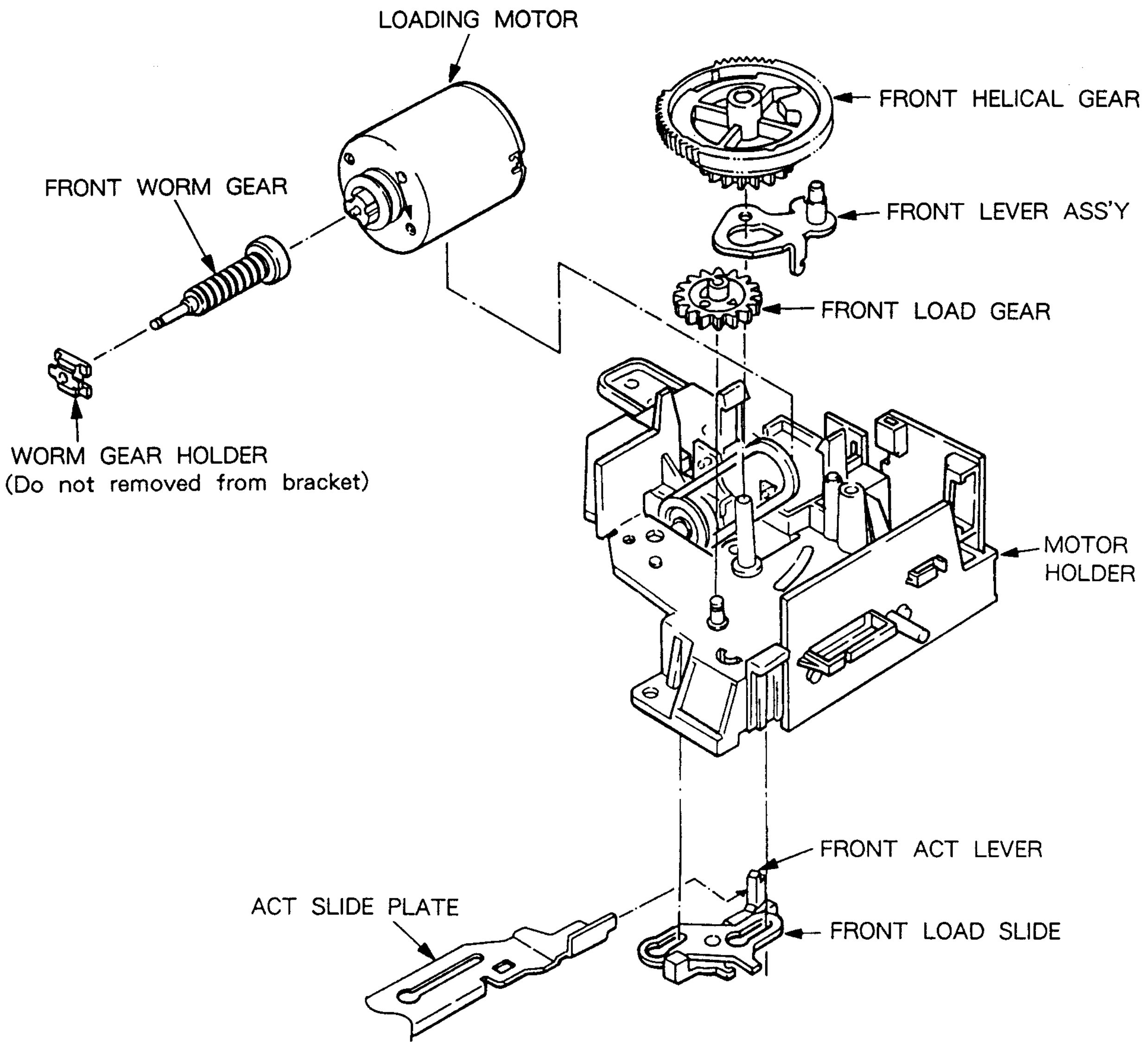
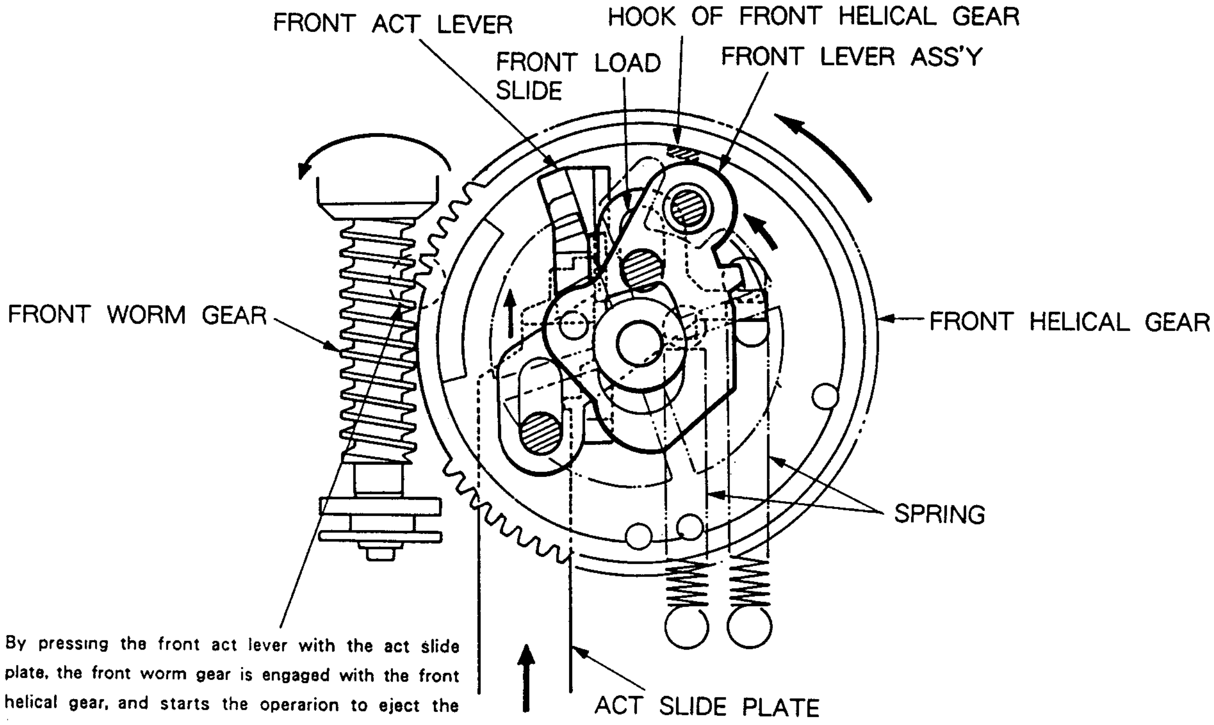

LOADING MOTOR
FRONT HELICAL GEAR
FRONT WORM GEAR
FRONT LEVER ASS'Y
FRONT LOAD GEAR
WORM GEAR HOLDER
(Do not removed from bracket)
MOTOR
HOLDER
FRONT ACT LEVER
ACT SLIDE PLATE
FRONT LOAD SLIDE

Fig. 2-16 FRONT LOADING DRIVE SELECTION MECHANISM


FRONT ACT LEVER
HOOK OF FRONT HELICAL GEAR
FRONT LOAD SLIDE
FRONT LEVER ASS'Y
FRONT WORM GEAR
FRONT HELICAL GEAR
SPRING
ACT SLIDE PLATE

By pressing the front act lever with the act slide plate, the front worm gear is engaged with the front helical gear, and starts the operarion to eject the cassette.

Fig. 2-17 CASSETTE EJECTION START OPERATION (See through top view)

2-5. CASSETTE HOLDER MECHANISM

2-5-1. Components

The exploded view of the cassette holder mechanism is shown in Fig. 2-18. This mechanism consists of a cassette tray for feeding the cassette tape to the specified position of the mechanism chassis, a side plate provided with L type holes for supporting and guiding it, the top plate for regulating the width of left and right, and a group of gears for driving the cassette tray.

The entire mechanism is of independent construction apart from the mechanism body. The holder is fixed on the mechanism chassis by inserting the pawls at two points and tightening the setscrews at two points, or at a total of four points.

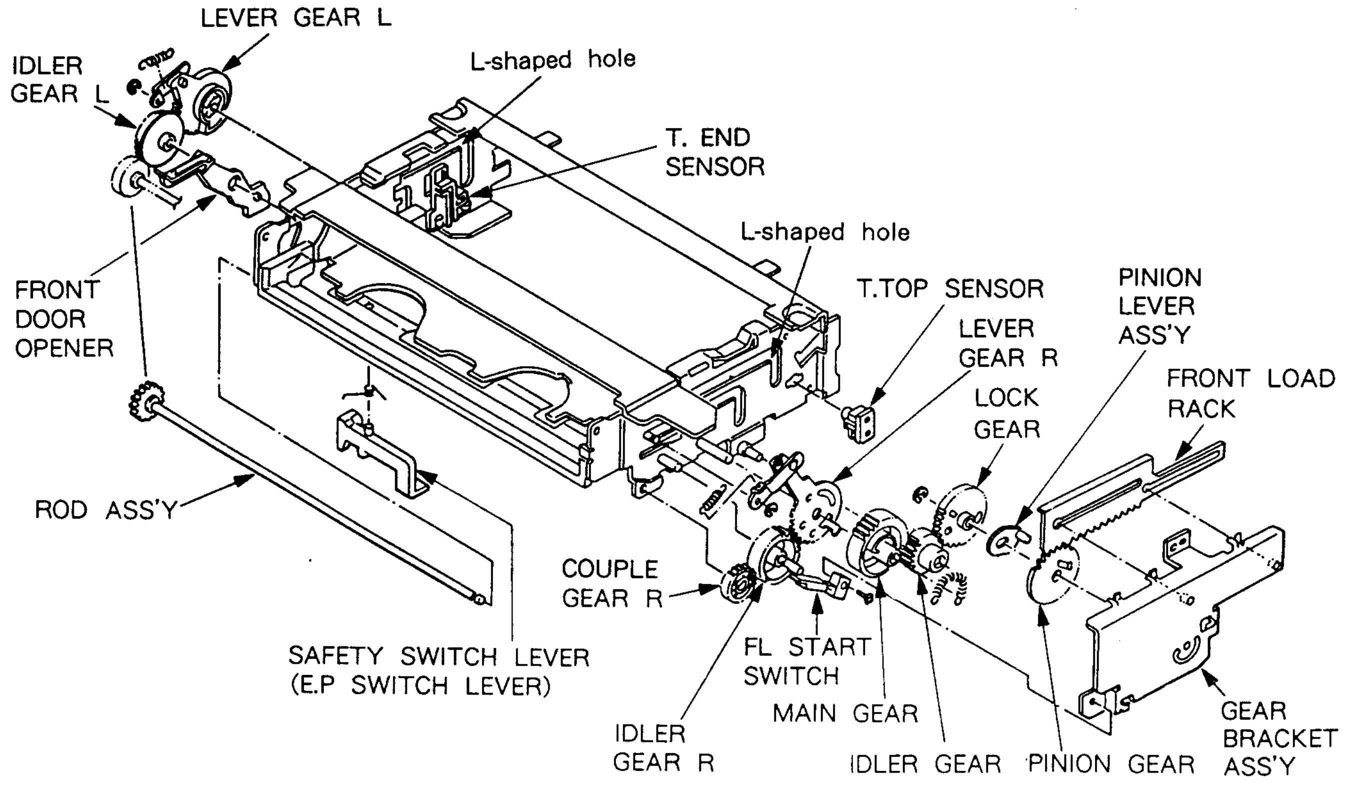

LEVER GEAR L
IDLER GEAR L
L-shaped hole
T. END SENSOR
L-shaped hole
FRONT DOOR OPENER
T.TOP SENSOR
LEVER GEAR R
PINION LEVER ASS'Y
LOCK GEAR
FRONT LOAD RACK
ROD ASS'Y
COUPLE GEAR R
SAFETY SWITCH LEVER (E.P SWITCH LEVER)
FL START SWITCH
MAIN GEAR
IDLER GEAR R
IDLER GEAR
PINION GEAR
GEAR BRACKET ASS'Y

Fig. 2-18 EXPLODED VIEW OF THE CASSETTE HOLDER MECHANISM

2-5-2. Description of Cassette Holder

The cassette holder is of motor-less design, as the lowering of mechanism height and driving source are done by the loading motor of the mechanism body.

As a substitute for the worm gear system hitherto used in the major drive section for the drive selection mechanism mentioned in section 2-4., the RACK LOADING system is adopted in this cassette holder mechanism. By this mechanism the motor-less design can be realized. An exploded view of the mechanism is shown in Fig. 2-19. A description of the operation is made below along with Fig. 2-19. To press-fit the cassette tape after sending it onto the mechanism chassis, the PINION GEAR section is triple construction. The FRONT LOAD RACK side and the IDLER GEAR side are independently engaged. The PINION GEAR and the LOCK GEAR are connected from the PINION LEVER PIN riveted to the PINION LEVER. Even after feeding the cassette tape to the specified position of the mechanism chassis, the FRONT LOAD RACK slides, giving the rotation to the PINION GEAR which is engaged with the FRONT LOAD RACK. At that time, a pin is dropped into the groove section provided on the GEAR BRACKET ASS'Y.

The other LOCK GEAR is fixed by this PINION LEVER PIN, and the cassette tape is press-fitted onto the mechanism chassis by linked IDLER GEAR. The before-mentioned FRONT LOAD RACK and the PINION GEAR are set free after dropping the PINION LEVER PIN into the groove section. So, the drive force of the loading motor is sent to the mechanism body.

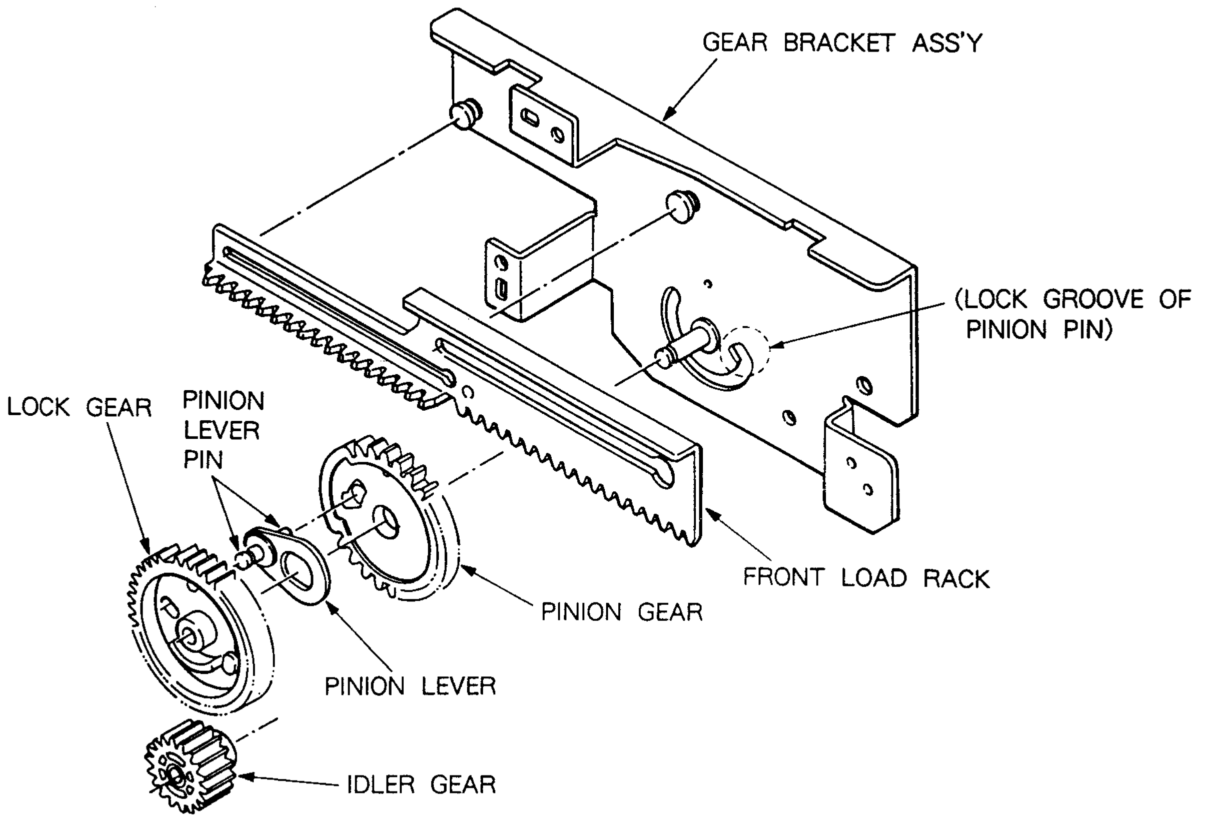


Fig. 2-19 RACK LOADING MECHANISM OF CASSETTE HOLDER

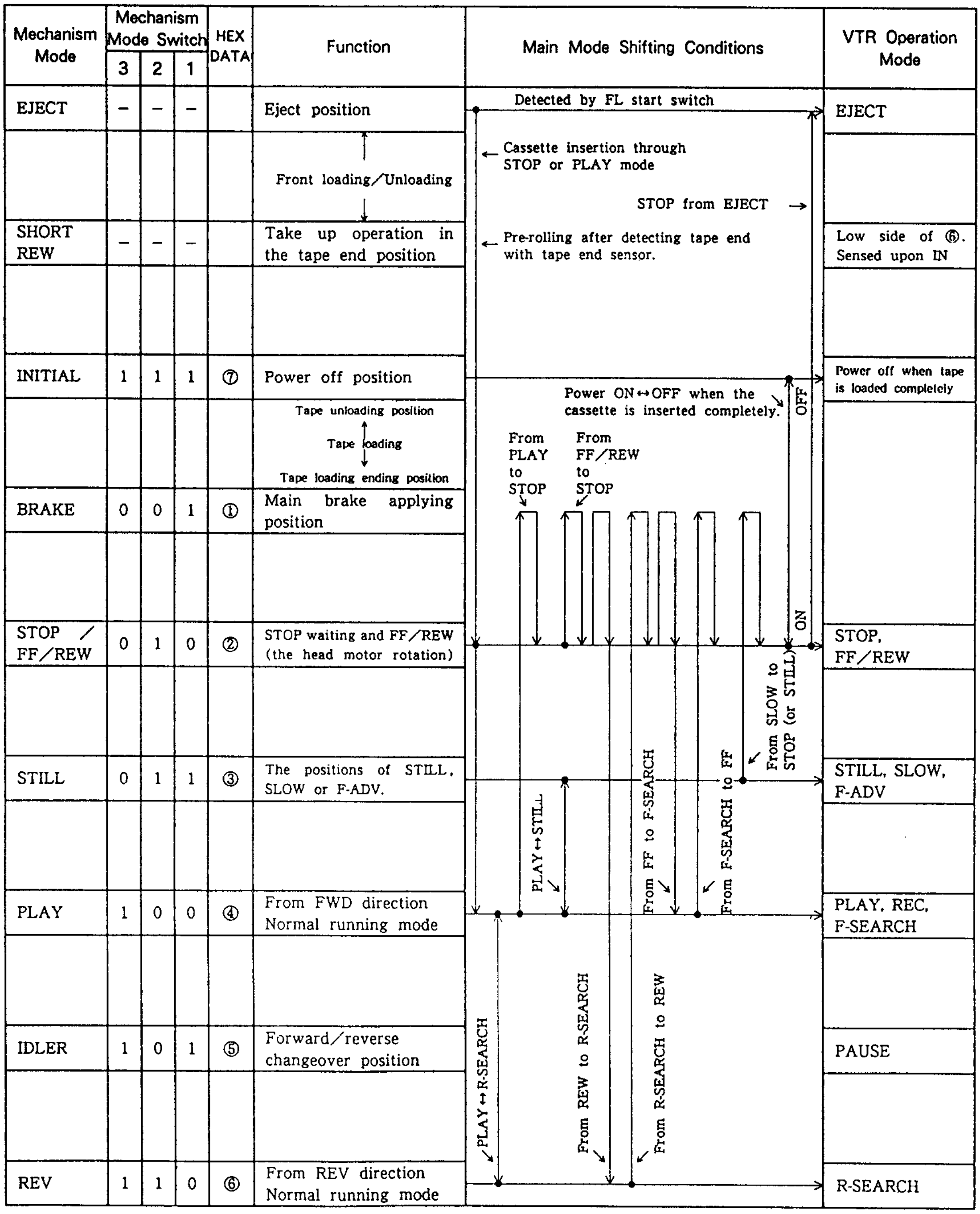
3. MECHANISM CONTROL

3-1. MODE ARRANGEMENT

This mechanism is arranged in such a mode layout as shown in Table. 3-1 and as described in section 2-1. The mode sensing switch described below is used for control of these modes.

3-2. MODE DETECTION SWITCH

For mode detecting one leaf switch (FL START SWITCH and one rotary switch (MECHANISM MODE SWITCH) are used in combination.



Mechanism Mode	Mechanism Mode Switch			HEX DATA	Function	VTR Operation Mode
	3	2	1			
EJECT	–	–	–		Eject position	EJECT
					Front loading/Unloading	
SHORT REW	–	–	–		Take up operation in the tape end position	Low side of ⑥. Sensed upon IN
INITIAL	1	1	1	⑦	Power off position	Power off when tape is loaded completely
					Tape unloading position Tape loading Tape loading ending position	
BRAKE	0	0	1	①	Main brake applying position	
STOP / FF/REW	0	1	0	②	STOP waiting and FF/REW (the head motor rotation)	STOP, FF/REW
STILL	0	1	1	③	The positions of STILL, SLOW or F-ADV.	STILL, SLOW, F-ADV
PLAY	1	0	0	④	From FWD direction Normal running mode	PLAY, REC, F-SEARCH
IDLER	1	0	1	⑤	Forward/reverse changeover position	PAUSE
REV	1	1	0	⑥	From REV direction Normal running mode	R-SEARCH

Main Mode Shifting Conditions
Detected by FL start switch
Cassette insertion through STOP or PLAY mode
STOP from EJECT
Pre-rolling after detecting tape end with tape end sensor.
Power ON↔OFF when the cassette is inserted completely.
OFF
ON
From PLAY to STOP
From FF/REW to STOP
From SLOW to STOP (or STILL)
From FF to F-SEARCH
From F-SEARCH to FF
PLAY↔STILL
PLAY↔R-SEARCH
From REW to R-SEARCH
From R-SEARCH to REW

Table 3-1

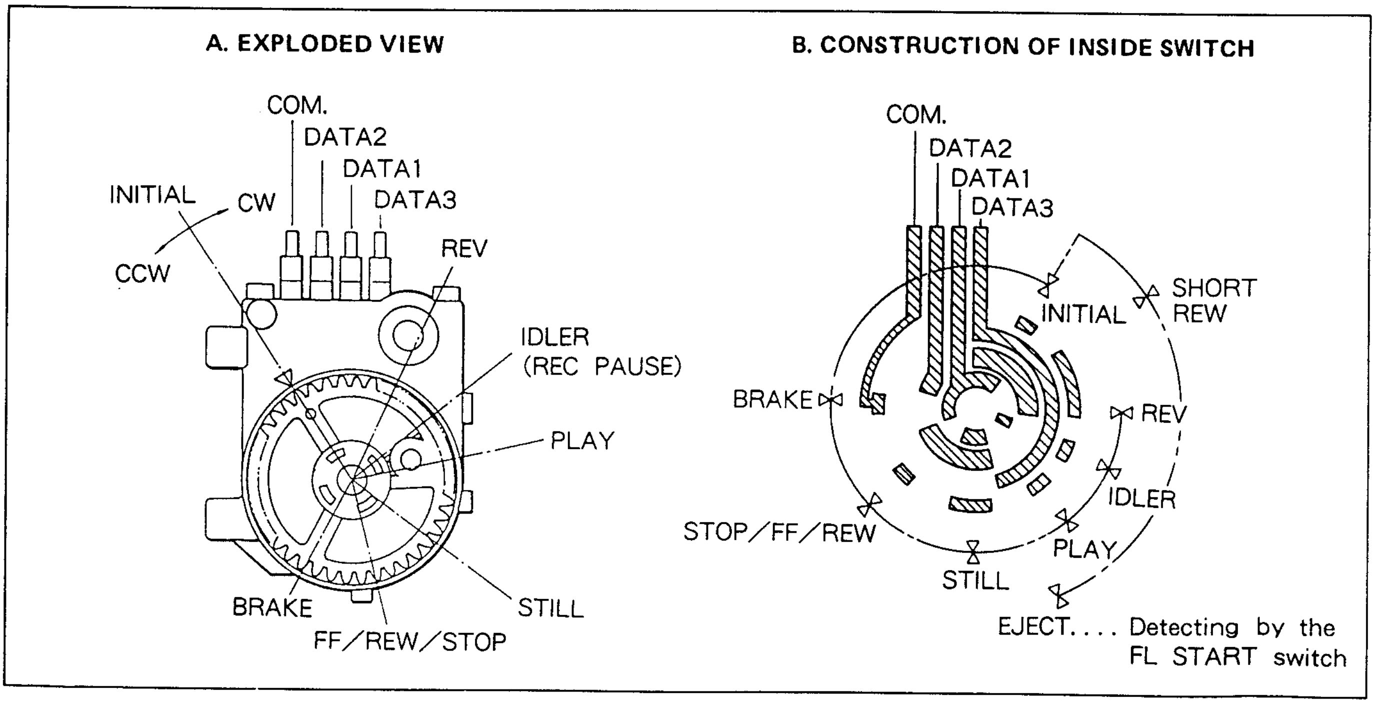
(1) Switch component
The mode switch consists of FL START SWITCH for detecting the cassette ejection and insertion, and MECHANISM MODE SWITCH for detecting the each mode position of the mechanism. As can be understood from Fig. 3-1, the MECHANISM MODE SWITCH rotates in excess of 360 degrees. Therefore, the sensing of a signal from the MECHANISM MODE SWITCH is done by the leaf switch.
In the P88 and P89 mechanisms, incidentally, short REW position is detected by the FL END SW, but in the P90 mechanism, the FL END SWITCH is not required due to a change in the internal structure of the MECHANISM MODE SWITCH.

(2) Mechanism mode switch
The mechanism mode switch consists of four terminals, namely, COM, DATA1, DATA2, and DATA3. These are processed as 3-bit signals for discrimination of seven modes.
The MECHANISM MODE SWITCH is not interchangeable with the hither to available black switch due to a change in its internal structure. Be sure therefore to use a blue switch.

3-3. CONSIDERATION TO FULL LOADING

① In the normal stop condition, the head drum is rotated to facilitate the start-up of the image at the time of playback, but it is conceivable that this is left undisturbed for an extended period of time. This may result in wear of the video head. For this reason, when five minutes elapse from the stop condition, the head drum stops rotating.

② To prevent the tape from being caught in the head drum due to dew forming, etc., the tape is housed in the unloaded cassette when turning the power off.


A. EXPLODED VIEW

B. CONSTRUCTION OF INSIDE SWITCH

COM.
DATA2
DATA1
DATA3
INITIAL
CW
CCW
REV
IDLER
(REC PAUSE)
PLAY
BRAKE
STILL
FF/REW/STOP
COM.
DATA2
DATA1
DATA3
SHORT
REW
INITIAL
BRAKE
REV
IDLER
STOP/FF/REW
PLAY
STILL
EJECT.... Detecting by the
FL START switch

Fig. 3-1 MECHANISM MODE SWITCH (ROTARY SWITCH)

4. MECHANISM MAINTENANCE AND CHECKING

4-1. PERIODIC CHECKING AND MAINTENANCE ITEMS AND SERVICE JIGS

The following maintenance and periodic checking procedures are recommended to ensure proper operation, and to protect the tape from dirt and damage. Also, these procedures should always be followed after repairing the unit.

4-1-1. Periodic Check Items

○ Cleaning ◎ Confirmation △ Lubrication

Part	Usage Time (hours)	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	Remarks
Tape Guide System	Tape running surfaces	○	○	○	○	○	○	○	○	○	○	
	ACE head	○	○	○	○	○	○	○	○	○	○	
	Drum (cylinder)	○	○	○	○	○	○	○	○	○	○	Head life depends heavily on operating conditions.
Drive System	Loading belt	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
	Reel drive belt	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
	Intermediate gear, pulley axles		△		△		△		△		△	Absolutely avoid oil on tape running surfaces.
	Capstan axles		△		△		△		△		△	
	Loading motor		◎		◎		◎		◎		◎	
Performance Check	Back tension torque		◎		◎		◎		◎		◎	50 ± 10 gcm
	Brake system		◎		◎		◎		◎		◎	
	FF, REV, PLAY torque		◎		◎		◎		◎		◎	FF : 600 gcm and over REW:750 gcm and over REV : 150 to 240 gcm PLAY : 100 to 160 gcm

Note : The back tension torque is the value that has been measured by the cassette torque meter (VHJ-0016).
The torque of FF, REV, REW, and PLAY represent those measured with them locked by the torque gauge.
FF and REW are values 2 seconds after starting.

4-1-2. Cleaning

① Drum (COMPL CYLINDER) and Video Heads (See Fig. 4-1-1.)

1) Wrap a chamois leather around your finger and moisten it with methyl alcohol.
2) Move the chamois leather to left and right several times on the video head to clean. There is a video head also on the opposite side, so clean it likewise. In Hi-Fi models, clean the audio head also.
3) Clean the tape path surface of the cylinder in the same way.

Note : Always turn power off before cleaning. Do never move the chamois leather vertically or apply too much force to the head ; it may be damaged.

② Cleaning of the Tape Guide System (See Fig. 4-1-2.)

1) Set the EJECT mode and clean the tape guide system (tape guides, impedance roller, FTE head, ACE head, pinch rollers, capstan axles, etc.) with a chamois leather moistened with methyl alcohol.

Note : Make sure that no oil, grease, etc. adhere to the chamois leather and that heads are not damaged.

③ Cleaning of the Drive System

1) Clean the drive system (loading belt, reel drive belt, pulley, supply reel table, etc.) with a soft cloth moistened with methyl alcohol.

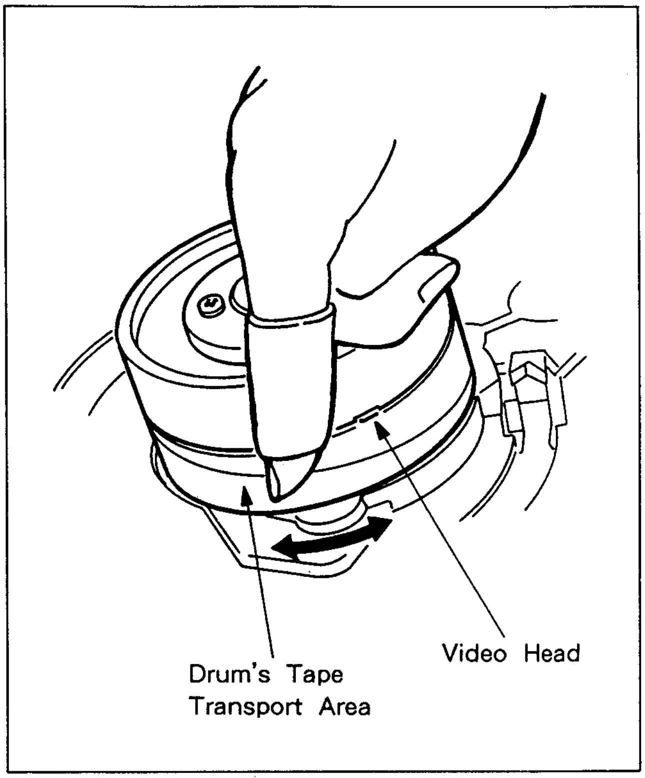

Video Head
Drum's Tape Transport Area

Fig. 4-1-1.

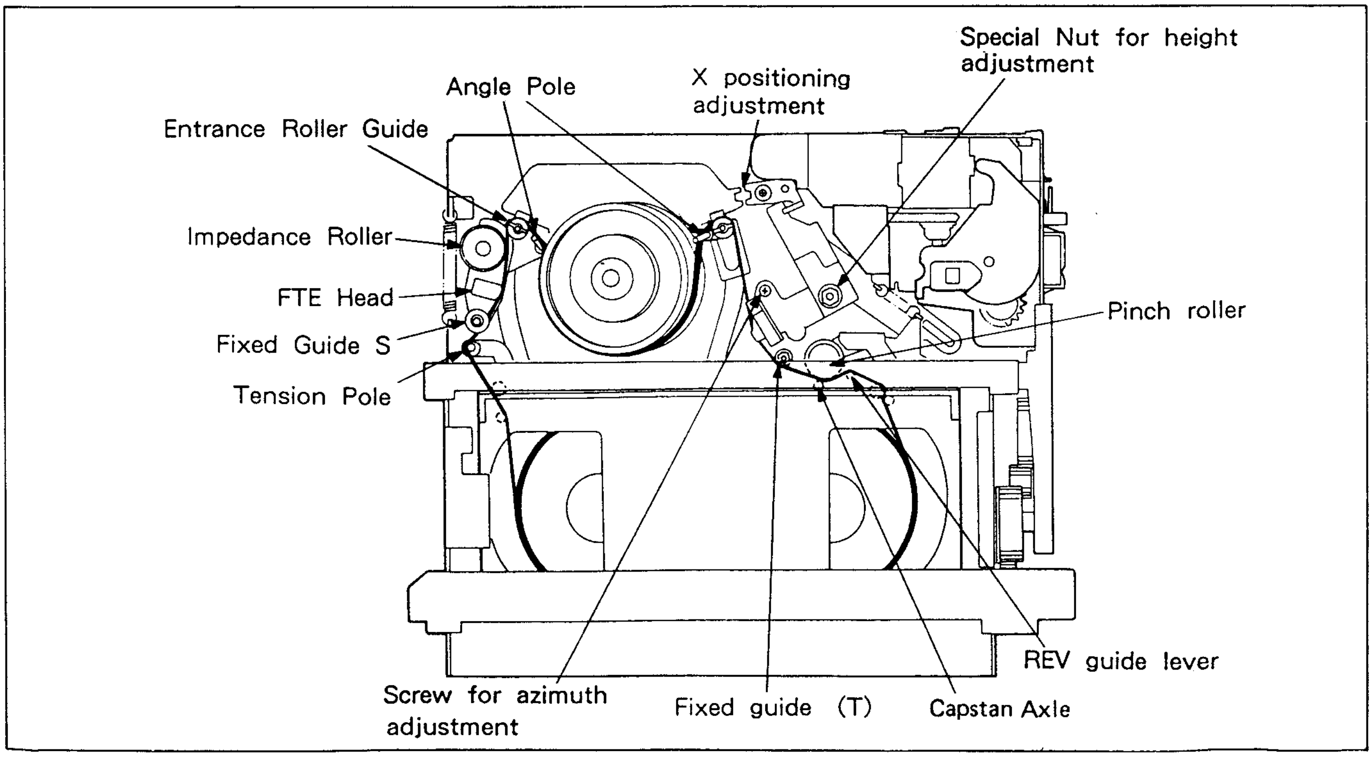
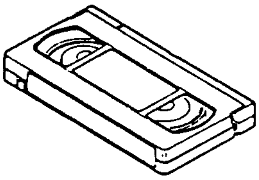

Special Nut for height adjustment
Angle Pole
X positioning adjustment
Entrance Roller Guide
Impedance Roller
FTE Head
Fixed Guide S
Tension Pole
Pinch roller
REV guide lever
Screw for azimuth adjustment
Fixed guide (T)
Capstan Axle

Fig. 4-1-2. Cleaning

4-1-3. Service Jigs

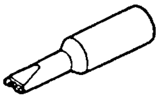
No.	Jig	Jig No.	Remarks
1	Alignment tape	VHJ-0008	SP color bar, 1kHz (normal)
2	Alignment tape	VHJ-0009	SP monoscope, 7kHz (normal)
3	Alignment tape	VHJ-0052	LP monoscope, 3kHz (normal)
4	Eccentric screwdriver	VHJ-0003	For tape path adjustment
5	Nut box	VHJ-0048	For tape path adjustment
6	Torque gauge	VHJ-0004	For reel take-up torque measurement
7	Cassette torquemeter	VHJ-0016	For back tension torque measurement
8	Position adjustment gauge	VHJ-0049	For position adjustment
9	Torque gauge screwdriver	VHJ-0014	For screw fastening torque adjustment
10	3mm dia. bit for torque screwdriver	VHJ-0045	Spare bit for the torque gauge screwdriver
11	Video head removing tool	VHJ-0041	For upper drum removal
12	Cassette stand plate gauge	VHJ-0001	For reel height adjustment
13	Mode selector	VHJ-0050	For mechanism mode selection
14	26-pin flexible flat cable	VHJ-0064	Spare cable for mode selector
15	Mode selector relay board	VHJ-0075	Relay board for mode selector
16	7-wire flat cable	VHJ-0076	Spare cable for relay board
17	REV guide lever removing tool	VHJ-0073	For REV guide lever removal
18	Fixed guide height gauge	VHJ-0053	For fixed guide (S) hight adjustment

VHJ-0008, VHJ-0009, VHJ-0052



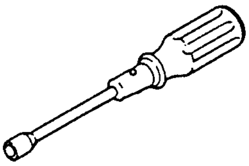
No. 1, 2, 3

VHJ-0003



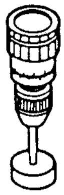
No. 4

VHJ-0048



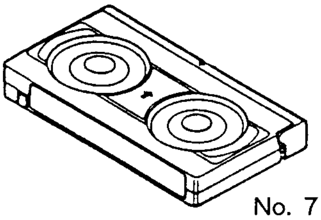
No. 5

VHJ-0004



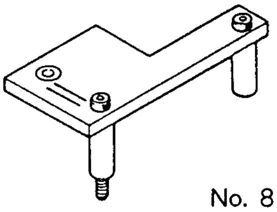
No. 6

VHJ-0016



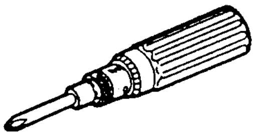
No. 7

VHJ-0049



No. 8

VHJ-0014



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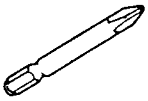

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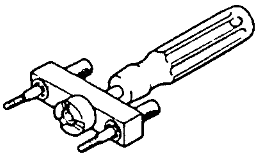

No. 11

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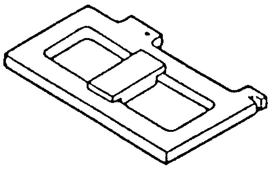

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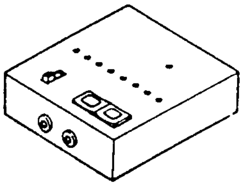
VHJ-0050



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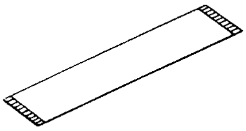

No. 14

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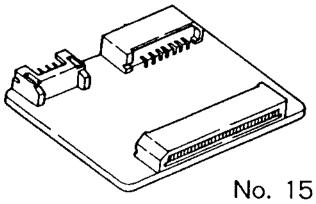

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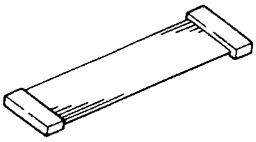

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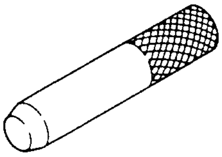

No. 17

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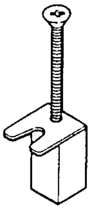


No. 18

4-2. MODE SELECTOR (VHJ-0050) HANDLING INSTRUCTIONS

The mode selector drives the loading motor of the P88 mechanism with its internal batteries (UM-2 × 4 = 6V), using LEDS to indicate the mode (EJECT, INITIAL, BRAKE, STOP/REW/FWD, STILL, PLAY, IDLER, REV) simultaneously with EJECT⇔REV mode changes.
Instead of the internal batteries, an external DC 6V power supply can also be used.

4-2-1. Part Names (See Fig. 4-2-1)

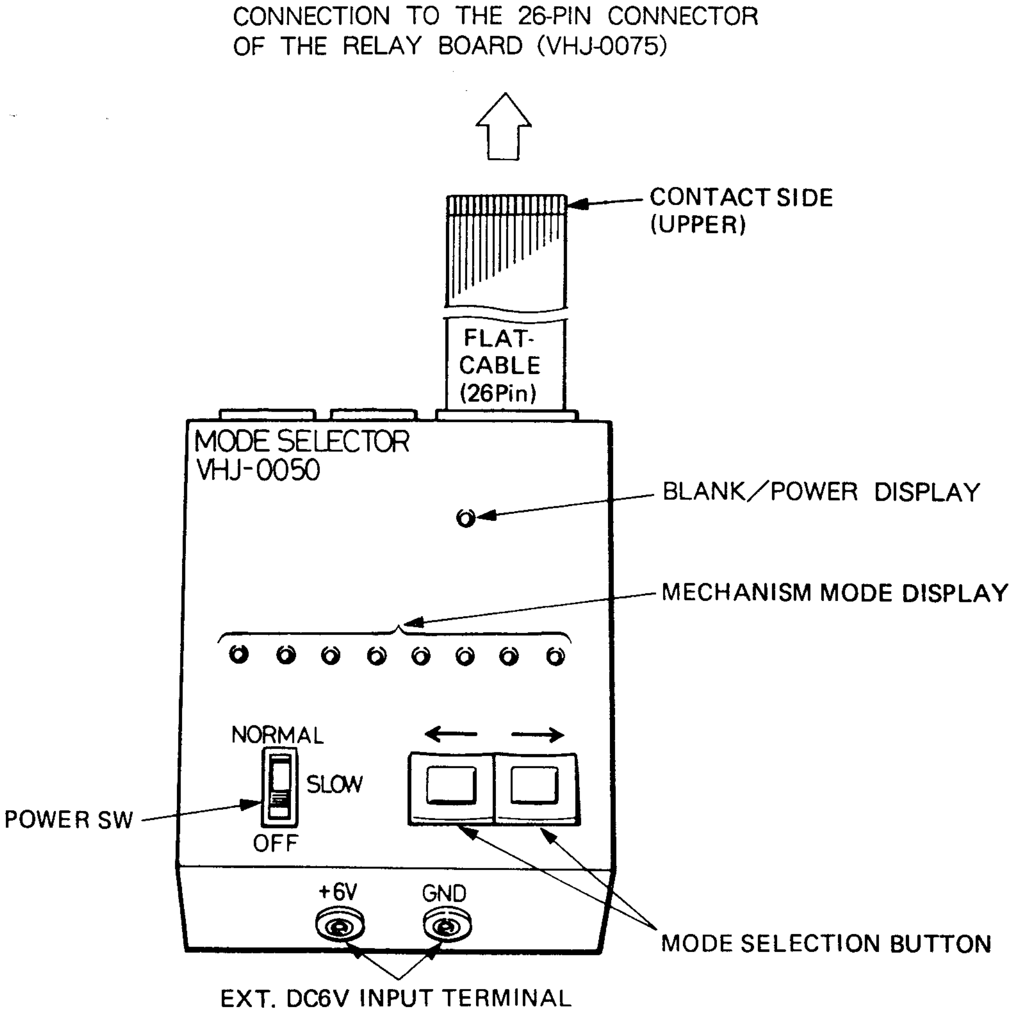

CONNECTION TO THE 26-PIN CONNECTOR OF THE RELAY BOARD (VHJ-0075)
CONTACT SIDE (UPPER)
FLAT-CABLE (26Pin)
MODE SELECTOR VHJ-0050
BLANK/POWER DISPLAY
MECHANISM MODE DISPLAY
NORMAL
SLOW
OFF
POWER SW
←
→
+6V
GND
MODE SELECTION BUTTON
EXT. DC6V INPUT TERMINAL

Fig. 4-2-1

4-2-2. Connection Method (See Fig. 4-2-2)

1) Remove the 7-wire cable connected from the system control circuit to the connector (CN822) of the MC-3 board.
2) Connect the 7-wire cable (VHJ-0076) between the connector (CN822) of the MC-3 board and the 7-pin connector of the Mode Selector Connection Board (VHJ-0075).
3) Remove the 6-wire cable extending from the cassette holder section from the connector of the System Control Circuit Board and connect it to the 6-pin connector of the Mode Selector Connection Board (VHJ-0075).
4) Connect a supplied 26-pin flat cable (VHJ-0064) of the mode selector (VHJ-0050) between the mode selector body and the 26-pin connector of the Connection Board (VHJ-0075).

Note : Care should be taken to avoid mistaking the direction of the contacting side when connecting a flexible flat cable.

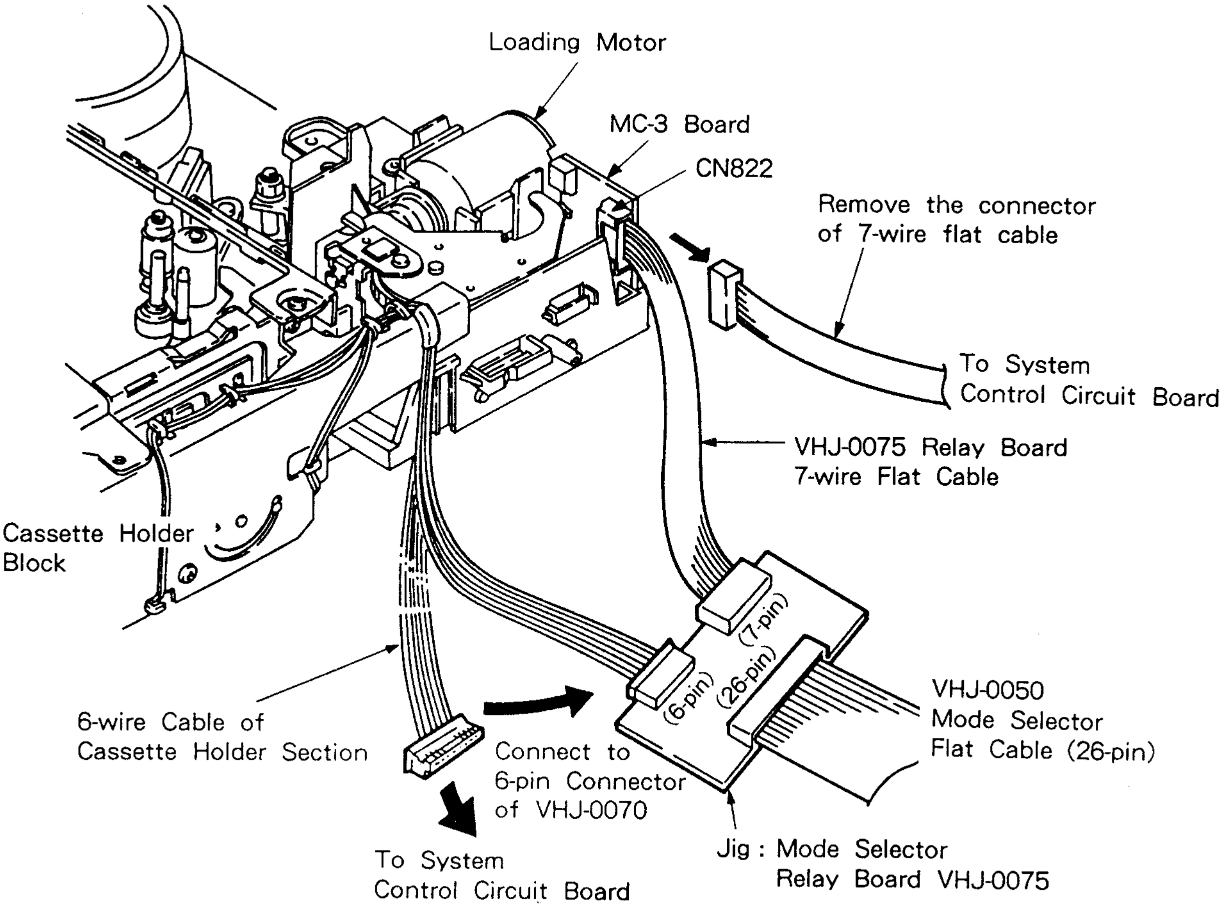

Loading Motor
MC-3 Board
CN822
Remove the connector of 7-wire flat cable
To System Control Circuit Board
VHJ-0075 Relay Board 7-wire Flat Cable
Cassette Holder Block
(7-pin)
(26-pin)
(6-pin)
VHJ-0050 Mode Selector Flat Cable (26-pin)
6-wire Cable of Cassette Holder Section
Connect to 6-pin Connector of VHJ-0070
To System Control Circuit Board
Jig : Mode Selector Relay Board VHJ-0075

Fig. 4-2-2 Connection

4-2-3. Handling Method

1) Keep the right side (⇨) of the mode selector key pressed, and the mode will change in the following sequence : EJECT⇨INITIAL⇨BRAKE⇨STOP/REW/FWD⇨STILL⇨PLAY⇨IDLER⇨REV.
2) When changing the mode in the REV···⇨EJECT direction, press the left side (⇦) of the mode selector key until the desired mode is indicated.
3) In the mid position of each mode during a shift to other mode, the "BLANK" LED lights. But the "PLAY", "IDLER", "REV" LEDs light between the EJECT mode and the INITIAL mode. Be sure therefore to check the mechanism body to see just what state the mechanism is in.
   Incidentally, if the mode selector is not connected to the mechanism, the "BLANK" LED lights to indicate the power ON.
4) The SLOW position of POWER switch makes relatively slow motions in comparison with the NORMAL position.

Note 1 : The mode selector drives the loading motor only, not affecting the head drum motor and the capstan motor. When using the mode selector with a cassette loaded, turn the capstan motor manually to remove tape slackness, preventing tape entanglement.

Note 2 : If the left side (⇦) of the mode selector (VHJ-0050) key is kept pressed with the COMPL cassette mechanism removed, it might get past the EJECT position, causing the front helical gear and the front worm gear to get disengaged.

In this condition, since the front helical gear will not turn even if the right side (⇨) of the mode selector key is pressed, rotate (push) the front helical gear clockwise by hand and engage it with the front worm gear. In this condition, as there is a misalignment between the mechanism main body operation mode (indicated by the mode selector indicator lamps) and the front loading mechanism operation mode, keep the right side (⇨) of the mode selector key pressed until the front helical gear and the front loading gear of the front loading mechanism get back to the initial condition (Refer to A and B in Fig. 5-3-2 of section 5-3-2. Loading Motor).

When the front loading mechanism returns to the initial condition, operation mode of the whole mechanism gets back to normal, matching the mode shown by the mode selector indicator lamps (mode is not properly indicated, however, during EJECT to INITIAL).

Sometimes, engagement of the front helical gear with the front worm gear is delayed, operation mode of the mechanism main body gets too much ahead and the front loading mechanism mode cannot be switched to the initial condition. In that case, press the left side (⇦) of the mode selector key, setting the mechanism main body operation mode back to EJECT (rotation of the mode cam and the MAIN CAM stops).

Note 3 : The mode selector indicator lamps show the mechanism operation mode, but the EJECT lamp may sometimes fail to indicate the actual mechanism operation mode.

5. MECHANISM DISMANTLING AND REASSEMBLING

5-1. MECHANISM MAIN UNIT (See Fig. 5-1-1.)

1. Removal

1) Remove the connectors of the COMPL MC-3 and the COMPL HEAD BRACKET.
2) Remove the flexible cable ① connecting the COMPL CYLINDER to the PRE-AMP UNIT ③ (See Fig. A).
3) Remove the two screws ②, then remove the PRE-AMP UNIT ③.
4) Remove the screw ④, then remove the PRE-AMP. BRACKET ⑤.
5) Remove the two screws ⑥.
6) Remove the three screws ⑦ and two screws ⑩, then lift up the mechanism main unit and remove it.
   Since the TRAY ⑧ obstructs removal of the two front screws ⑩, move the TRAY LOCK LEVER ⑨ in the direction of the arrow to unlock, then slide the TRAY ⑧ before removing the screws. (See Fig. B)

Note : Shape of the PRE-AMP UNIT ③ and the PRE-AMP. BRACKET ⑤ differ depending on the model.

2. Remounting

1) Mount the mechanism main unit onto the chassis with the three screws ⑦ and two screws ⑩.
2) Tighten the two screws ⑥.
3) Mount the PRE-AMP. BRACKET ⑤ with the two screws ④.
4) Mount the PRE-AMP UNIT ③ and the ground lug with the two screws ② (some models are not provided with a ground lug).
5) Insert the flexible cable ① into the connector of the PRE-AMP UNIT.
6) Connect the connectors of COMPL MC-3 and COMPL HEAD BRACKET.

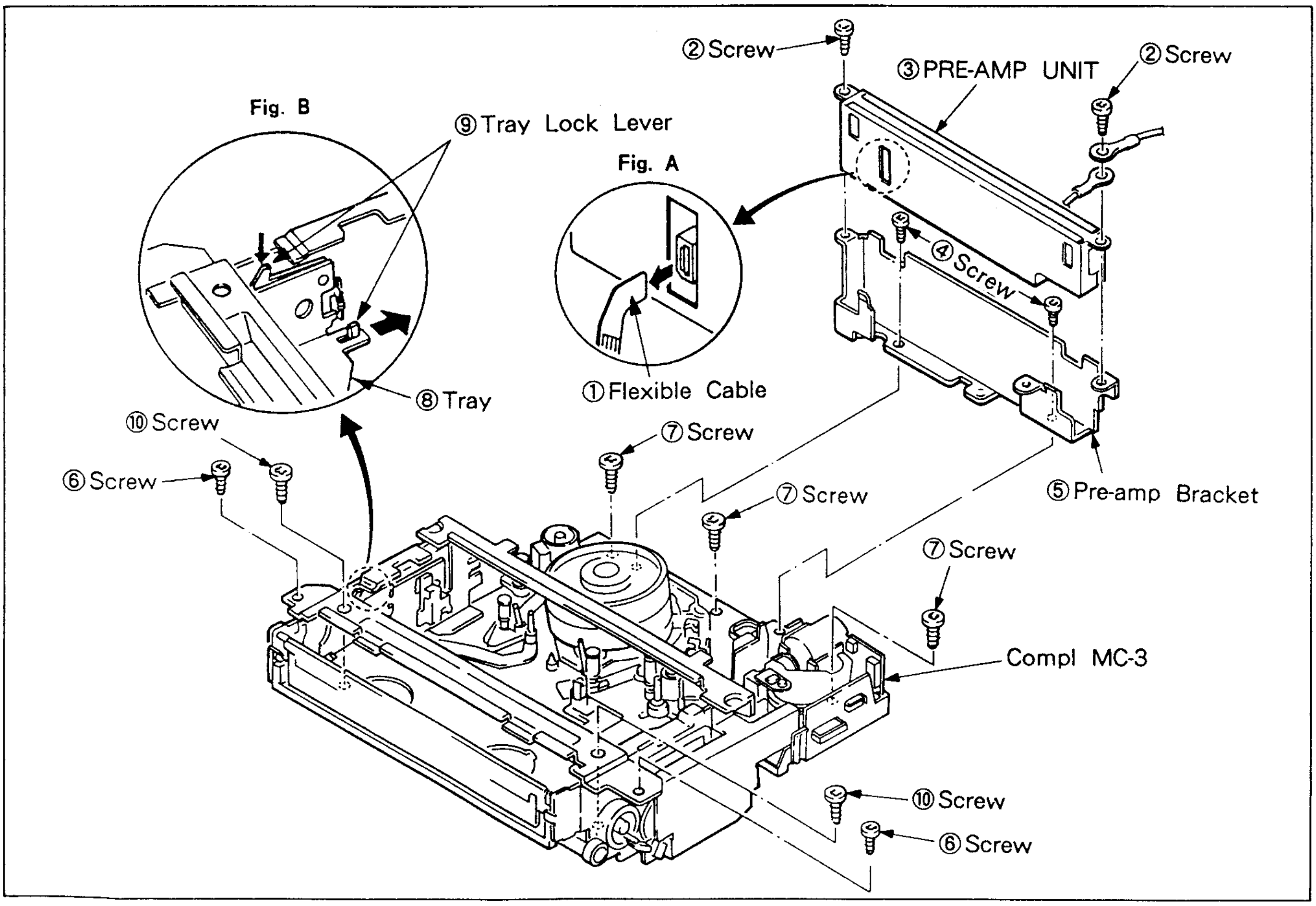

②Screw
③PRE-AMP UNIT
②Screw
Fig. B
⑨Tray Lock Lever
Fig. A
④Screw
①Flexible Cable
⑧Tray
⑩Screw
⑥Screw
⑦Screw
⑦Screw
⑤Pre-amp Bracket
⑦Screw
Compl MC-3
⑩Screw
⑥Screw

Fig. 5-1-1 Mecahnism Main Unit

5-2. CASSETTE HOLDER MECHANISM

5-2-1. COMPL Cassette Mechanism (See Fig. 5-2-1.)

1. Removal

1) Set the video main unit to the EJECT completed mode.
2) Pull out the connectors (6-PIN CONNECTOR connected to the system control circuit board, ACE HEAD CONNECTOR, and FTE HEAD CONNECTOR) from CASSETTE HOLDER.
3) Remove the two screws ①.
4) Remove the two screws ②.
5) Lift up the COMPL CASSETTE MECHANISM ④ back a little and remove the two hooks ③ on the front (See Fig. B). When doing so, make sure that the SAFETY SWITCH LEVER is not caught by the mechanism chassis.

2. Remounting

1) Set the chassis section mechanism to the EJECT mode with the mode selector (VHJ-0050) (looking from above, match the front loading gear hole ⑤ with the MOTOR HOLDER hole ⑥ as shown in Fig. A).
2) Set the COMPL CASSETTE MECHANISM ④ to the EJECT completed mode.
3) Mount the COMPL CASSETTE MECHANISM ④ onto the mechanism chassis, aligning it with the protuberance.
   Match positions of the FRONT LOADING GEAR △ mark ⑦ and the RACK EJECT mark ⑧. (See Fig. A.)
4) Fix to the mechanism chassis with the two screws ②.
5) Fix to the chassis with the screw ①.
6) Connect to the various connectors.

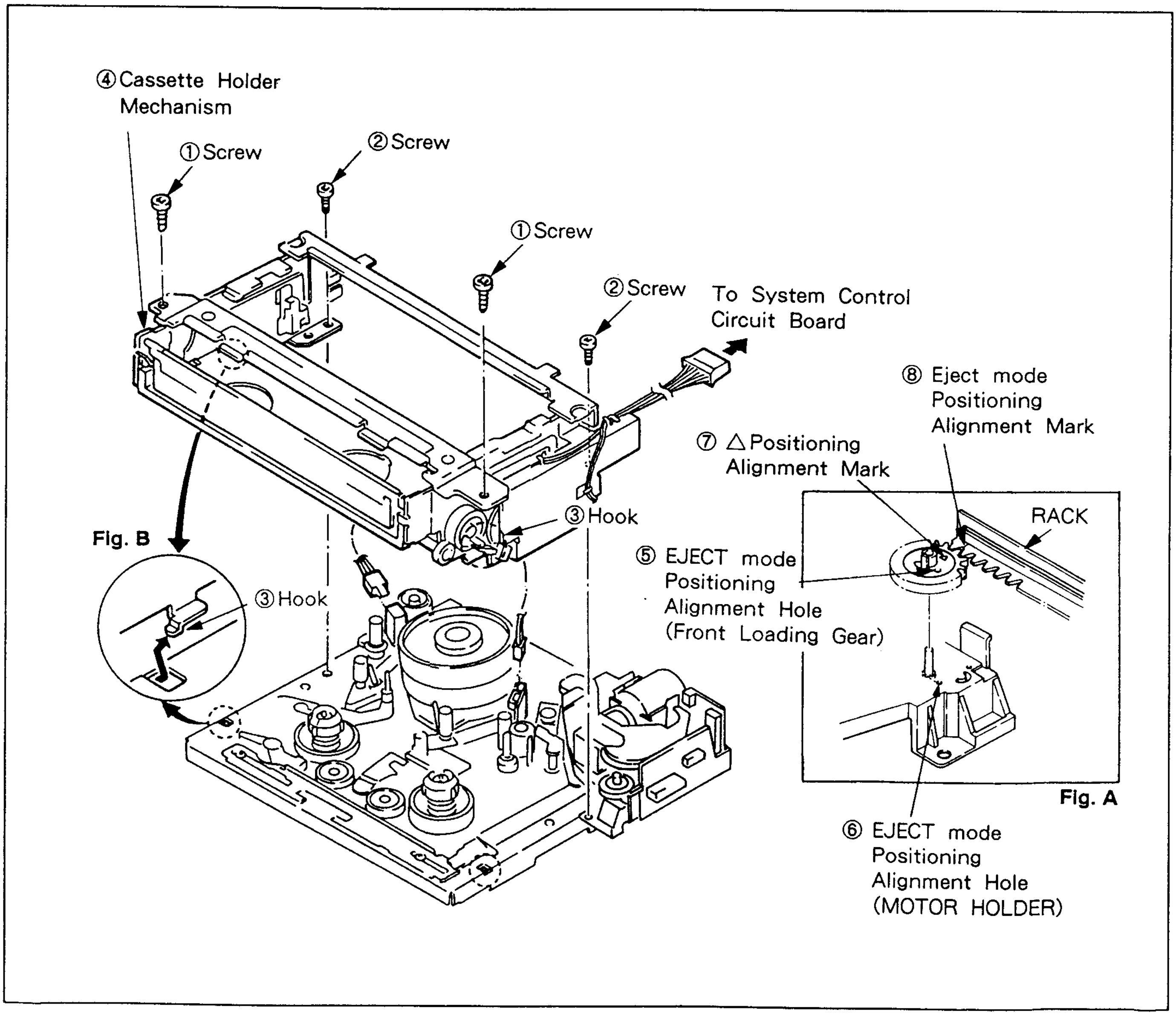

④Cassette Holder Mechanism
①Screw
②Screw
①Screw
②Screw
To System Control Circuit Board
⑧ Eject mode Positioning Alignment Mark
⑦ △Positioning Alignment Mark
RACK
③Hook
⑤ EJECT mode Positioning Alignment Hole (Front Loading Gear)
Fig. B
③Hook
Fig. A
⑥ EJECT mode Positioning Alignment Hole (MOTOR HOLDER)

Fig. 5-2-1 Compl Cassette Mechanism

5-2-2. Gear Bracket Ass'y (See Fig. 5-2-2.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the four screws ①, then remove the GEAR BRACKET ASS'Y ②.
3) Remove the E ring ③, then remove the LOCK GEAR ④, the PINION LEVER ASS'Y ⑤, the PINION GEAR ⑥ and the RACK ⑦, in that order.

2. Remounting

1) Apply grease to the shaft ⑧ and the two pins ⑨ of the GEAR BRACKET ASS'Y.
2) Apply grease to the pin ⑩ of the PINION LEVER ASS'Y.
3) Apply grease to the toothed part of the RACK ⑦.
4) Fit the RACK ⑦ onto the two pins ⑨. Match position of the hole ⑪ to the GEAR BRACKET hole ⑫.
5) Mount the PINION GEAR ⑥, PINION LEVER ASS'Y ⑤, and LOCK GEAR ④ in the shaft ⑧ in the order mentioned.
   Set the hole ⑬ of the PINION GEAR and the LOCK GEAR with the hole ⑪ of the RACK for proper positioning at that time.
6) Mount them in E-ring shaft.
7) Set the GEAR BRACKET ASS'Y ② to the dowel and mount it using four screws ①.
   Set the hole Ⓐ of the IDLER GEAR with the hole Ⓑ of the SIDE BOARD as shown in Fig. 5-2-3 at this time.
   Also set the hole ⑬ of the PINION GEAR and the LOCK GEAR with the hole ⑫ of the GEAR BRACKET by referring to Fig. 5-2-2. After mounting them, check to be sure that FL START SWITCH ⑭ is in the ON state shown in Fig. A.
8) Remount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.

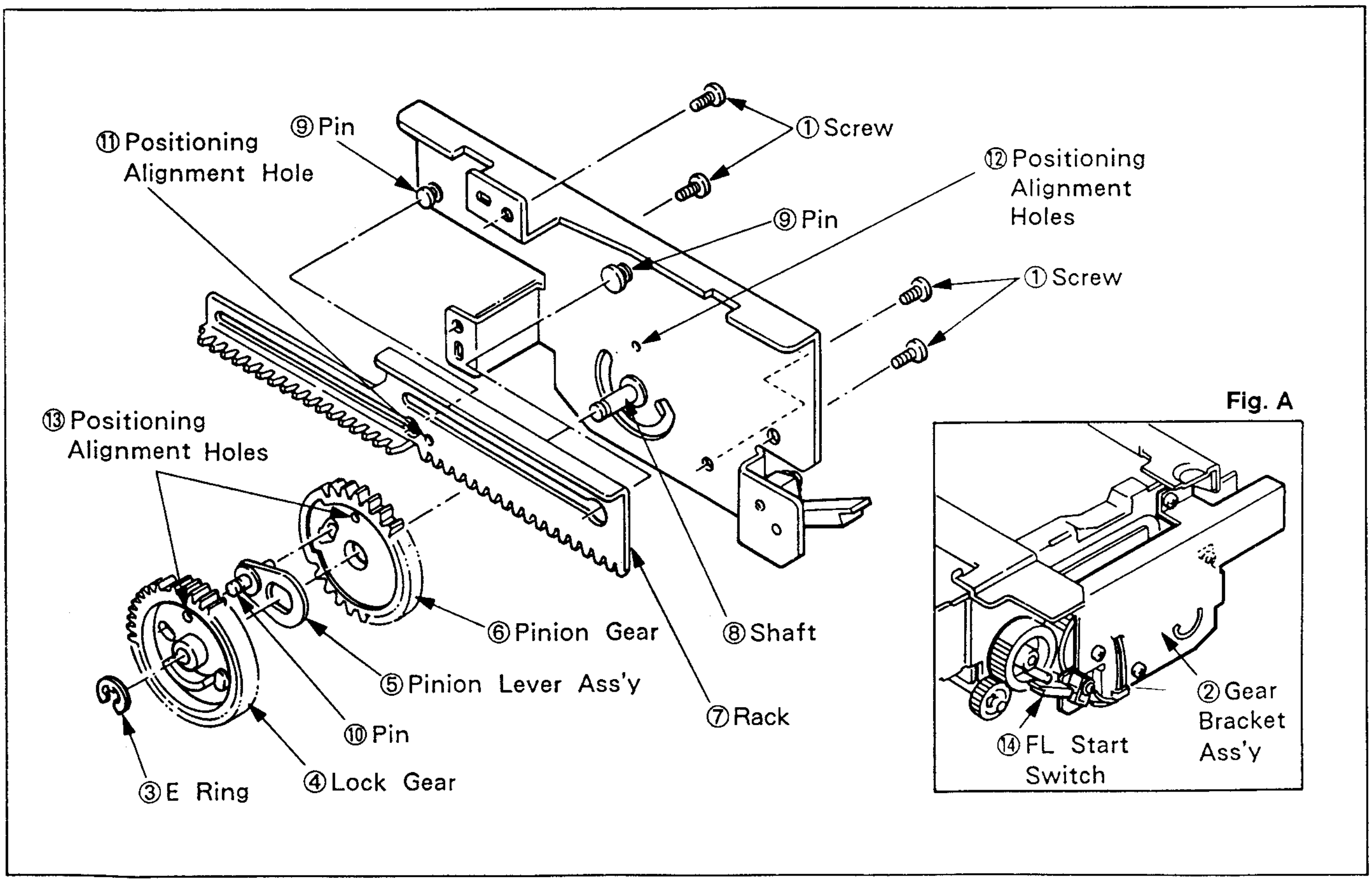

⑪ Positioning Alignment Hole
⑨ Pin
① Screw
⑫ Positioning Alignment Holes
⑨ Pin
① Screw
⑬ Positioning Alignment Holes
Fig. A
⑥ Pinion Gear
⑧ Shaft
⑤ Pinion Lever Ass'y
⑦ Rack
⑩ Pin
③ E Ring
④ Lock Gear
② Gear Bracket Ass'y
⑭ FL Start Switch

Fig. 5-2-2. Gear Bracket Ass'y

5-2-3. Cassette Drive Gear (Right) (See Fig. 5-2-3.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM and the GEAR BRACKET ASS'Y as instructed in 5-2-1. and 5-2-2., respectively.
2) Remove the IDLER GEAR ①.
3) Remove the SPRING COIL ②, then remove the MAIN GEAR ③.
4) Remove the E ring ④, then remove the LEVER GEAR ASS'Y R ⑤.
5) Open the hook ⑥ and remove the COUPLE GEAR R ⑦. Take care not to open the hook ⑥ too much, otherwise it may get deformed or broken. If it does, replace it.
6) Remove the IDLER GEAR R ⑧.

2. Remounting

1) Apply grease to gear parts that undergo friction.
2) Mount the IDLER GEAR R ⑧ onto the axle ⑨.
3) Mount the COUPLE GEAR R ⑦ onto the ROD ASS'Y axle ⑩. When doing so, match the couple gear position with the IDLER GEAR R ⑧ as shown in Fig. A.
4) Mount the LEVER GEAR ASS'Y R ⑤ onto the axles ⑪ and ⑫. Match position to the IDLER GEAR R ⑧ as shown in Fig. A.
5) Mount the E ring ④ onto the axle ⑫.
6) Mount the MAIN GEAR ③ onto the axle ⑪. When doing so, match position to the IDLER GEAR R ⑧ as shown in Fig. A.
7) Hook the SPRING COIL ② to the notch ⑬ in the MAIN GEAR R ③ and the LEVER GEAR ASS'Y R.
8) Mount the IDLER GEAR ① onto the axle ⑭. When doing so, match position to the MAIN GEAR as shown in Fig. A.
9) Mount the GEAR BRACKET ASS'Y and the COMPL CASSETTE MECHANISM ASS'Y as instructed in 5-2-2. and 5-2-1., respectively.

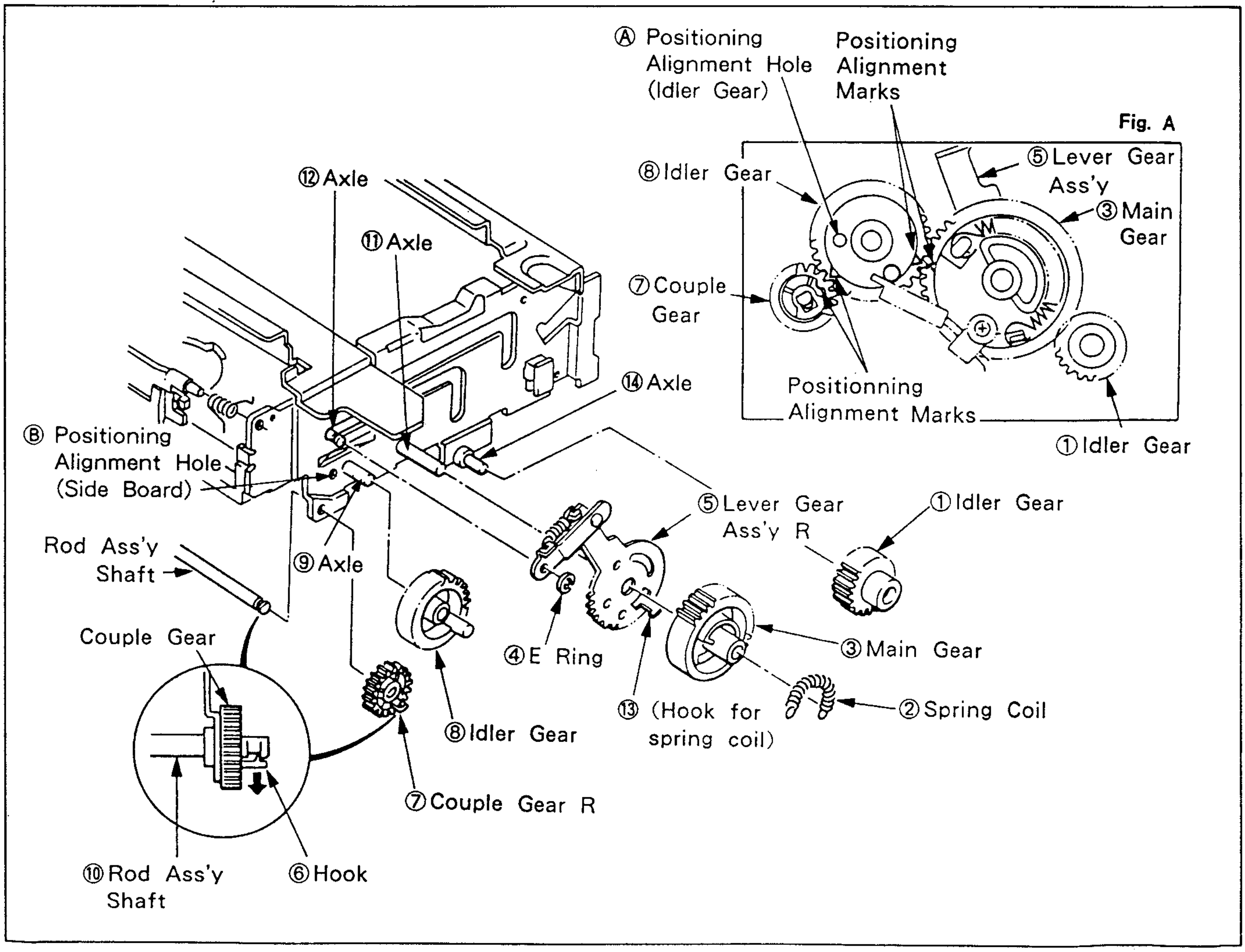

Ⓐ Positioning Alignment Hole (Idler Gear)
Positioning Alignment Marks
Fig. A
⑤Lever Gear Ass'y
③Main Gear
⑧Idler Gear
⑦Couple Gear
Positionning Alignment Marks
①Idler Gear
⑫Axle
⑪Axle
⑭Axle
Ⓑ Positioning Alignment Hole (Side Board)
Rod Ass'y Shaft
⑨Axle
Couple Gear
⑤Lever Gear Ass'y R
①Idler Gear
④E Ring
③Main Gear
⑬ (Hook for spring coil)
②Spring Coil
⑧Idler Gear
⑦Couple Gear R
⑩Rod Ass'y Shaft
⑥Hook

Fig. 5-2-3. Cassette Drive Gears (Right Side)

5-2-4. Cassette Drive Gear (Left) (See Fig. 5-2-4)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the COUPLE GEAR R as instructed in 5-2-3.
3) Remove the ROD ASS'Y ①.
4) Remove the E ring ②.
5) Remove the hook ③, then remove the LEVER GEAR ASS'Y L ④. Take care not to open the hook ③ too much, otherwise it may get deformed or broken. If it does, replace it.
6) Remove the SPRING COIL ⑤ from the LEVER GEAR ASS'Y ④.
7) Remove the IDLER GEAR L ⑥ and the DOOR OPEN LEVER ⑦.

2. Remounting

1) Apply grease to the axles ⑧, ⑨ and ⑩.
2) Apply grease to the IDLER GEAR L ⑥.
3) Mount the DOOR OPEN LEVER ⑦ onto the axle ⑧. Do it so that the end of the DOOR OPEN LEVER ⑦ leans against the front side of the CASSETTE DOOR ⑪ as shown in Fig.. A.
4) Mount the IDLER GEAR L ⑥ onto the axle ⑧.
5) Pass the ROD ASS'Y ① through the hole ⑫. Match position of the COUPLE GEAR L ⑬ and the IDLER GEAR L ⑥ as shown in Fig B.
6) Mount the COUPLE GEAR R as instructed in 5-2-3.
7) Hook the SPRING COIL ⑤ to the LEVER GEAR ASS'Y L ④.
8) Mount the LEVER GEAR ASS'Y L ④ onto the axle ⑨ and the shaft ⑩. Match position to the IDLER GEAR L ⑥ as shown in Fig. B.
9) Mount the COMPL CASSETTE MECHANISM onto the chassis as instructed in 5-2-1.

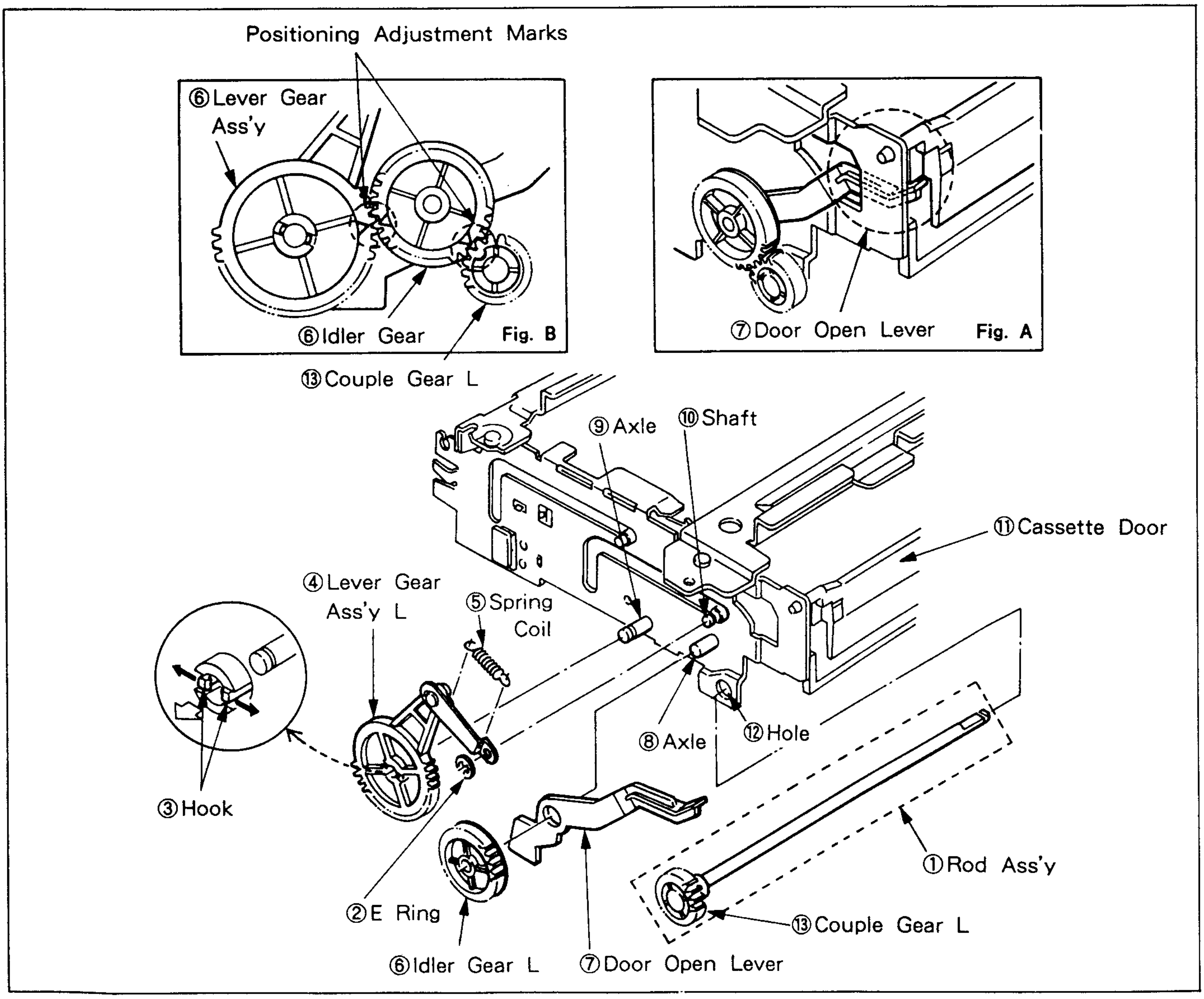

Positioning Adjustment Marks
⑥Lever Gear Ass'y
⑥Idler Gear
Fig. B
⑬Couple Gear L
⑦Door Open Lever
Fig. A
⑨Axle
⑩Shaft
⑪Cassette Door
④Lever Gear Ass'y L
⑤Spring Coil
③Hook
⑧Axle
⑫Hole
①Rod Ass'y
②E Ring
⑬Couple Gear L
⑥Idler Gear L
⑦Door Open Lever

Fig. 5-2-4. Cassette Drive Gears (Left Side)

5-2-5. FL Start Switch (See Fig. 5-2-5.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the screw ①.
3) Remove the lead wire of the FL START SWITCH ②.

2. Remounting

1) Solder the lead wire to the FL START SWITCH ② terminal.
2) Align the FL START SWITCH ② protuberance to the hole ⑤, then mount it onto the GEAR BRACKET ASS'Y ③ with the screw ①. Do it so that the FL START SWITCH ② is turned ON by holding the pin ④ of IDLER GEAR in the EJECT completed mode.
3) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.

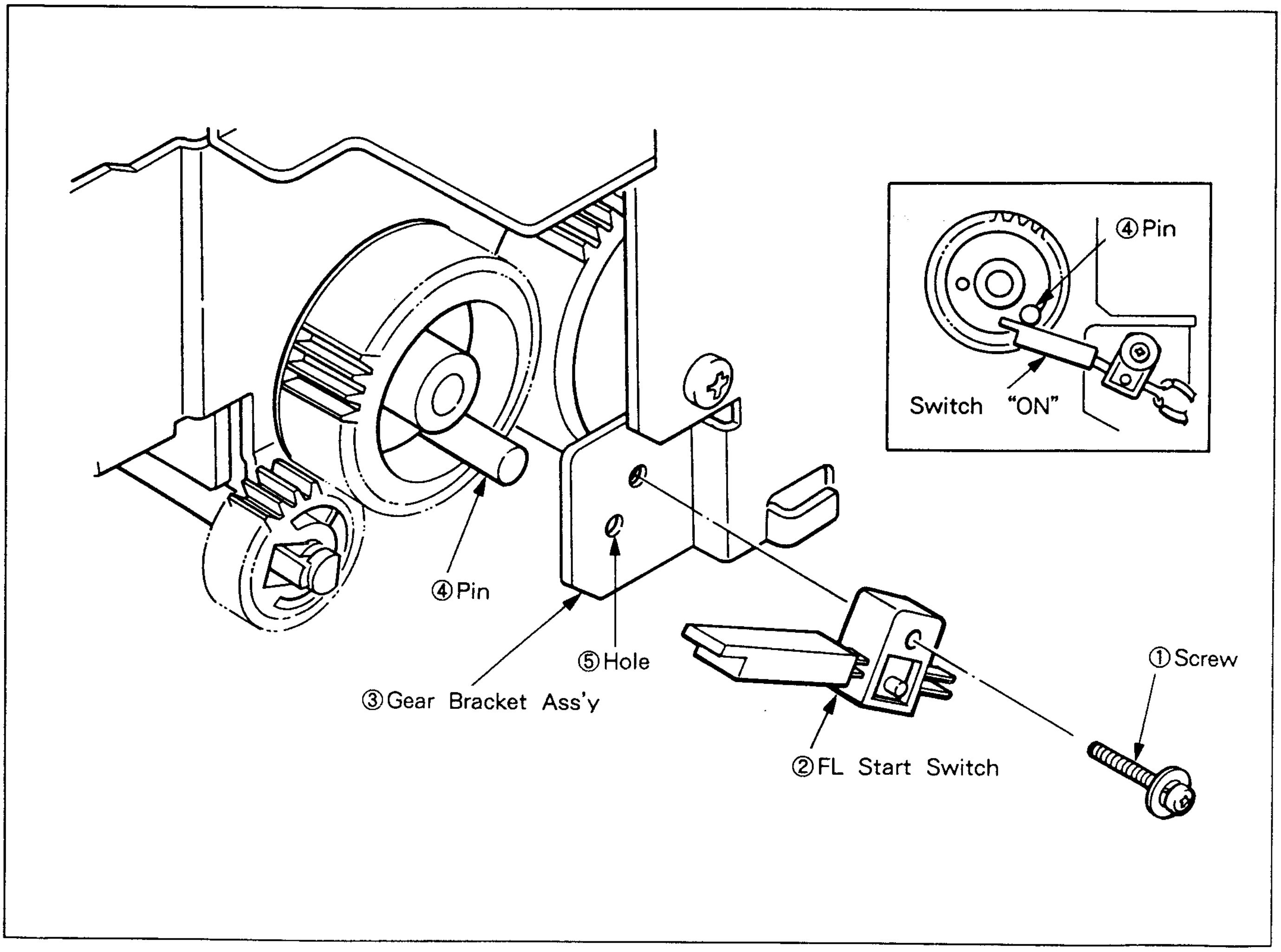

④Pin
Switch "ON"
④Pin
⑤Hole
③Gear Bracket Ass'y
①Screw
②FL Start Switch

Fig. 5-2-5. FL Start Switch

5-2-6. T-Top Sensor, T-End Sensor (See Fig. 5-2-6.)

1. Removal

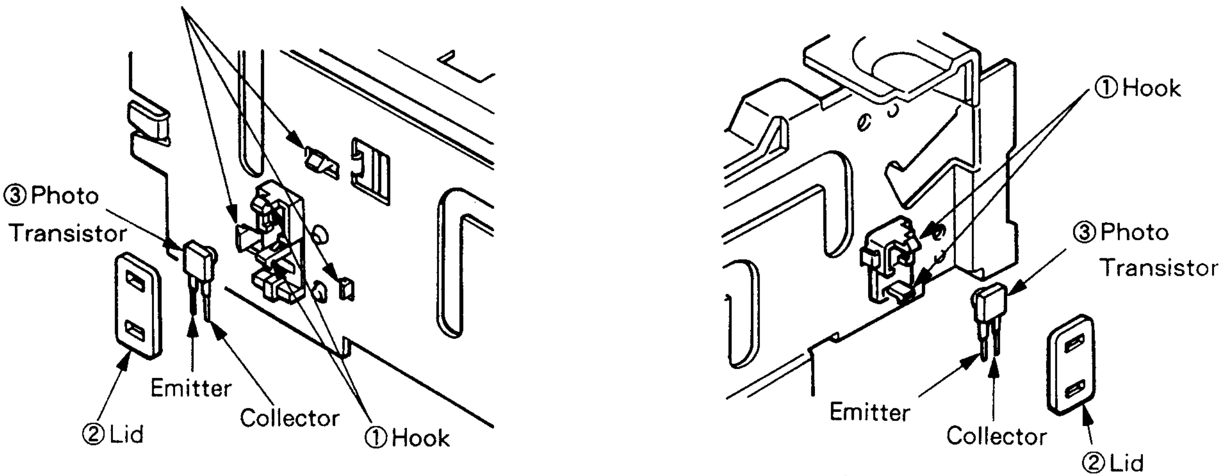
1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) When removing the T-TOP SENSOR, remove the GEAR BRACKET ASS'Y as instructed in 5-2-2.
3) Unhook the hook ① as instructed in Fig. A, then remove the LID ②. Take care not to push the hook ① too much, otherwise it may be deformed or broken.
4) Remove the phototransistors ③, then remove the lead wire.

Note : Mounting position of the transistor holder on the T-END SENSOR side is precisely adjusted at the factory, so do never remove it from the COMPL CASSETTE MECHANISM.

2. Remounting

1) Solder the brown lead wire to the emitter side, and the red lead wire to the collector side of the T-TOP SENSOR phototransistor ③.
   Solder the orange lead wire to the emitter side, and the yellow lead wire to the collector side of the T-END SENSOR phototransistor.
2) Mount the phototransistors ③ onto their respective holders.
3) Mount the LID ② and fix it with the hook ①.
4) Mount the GEAR BRACKET ASS'Y as instructed in 5-2-2.
5) Mount the COMPL CASSETTE MECHANISM as insturcted in 5-2-1.

Do not remove the holder from the compl cassette mechanism.



(T • END Sensor)

(T • TOP Sensor)

Fig. A

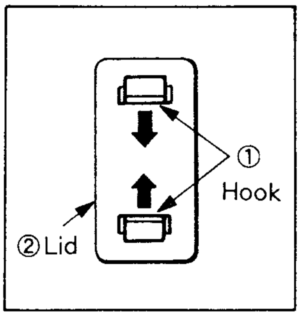


Fig. 5-2-6. T TOP Sensor & T END Sensor

5-3. COMPL HOLDER MOTOR (LOADING MOTOR BLOCK)

5-3-1. COMPL Motor Bracket

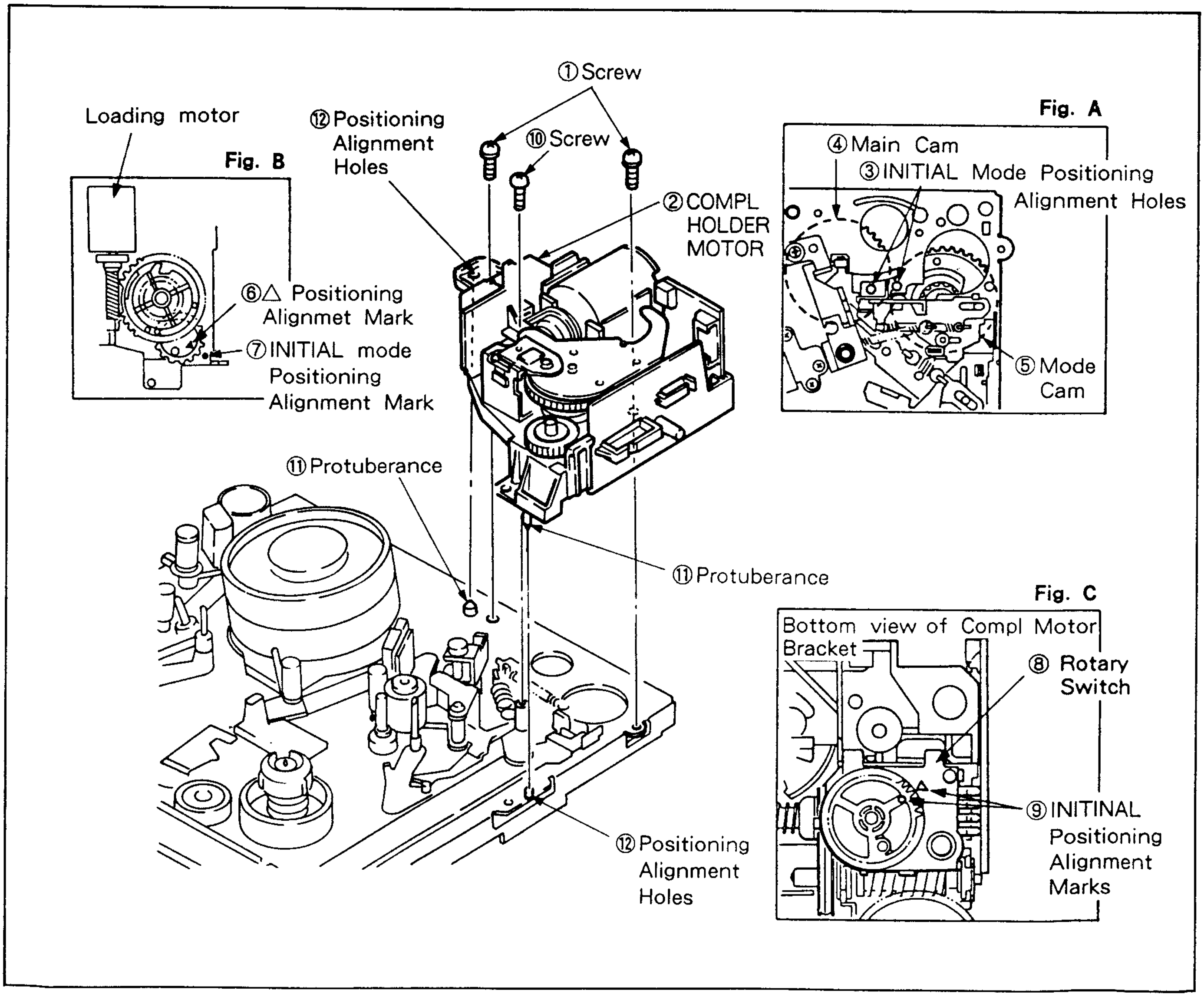
1. Removal

1) Remove the PRE-AMP UNIT and the PRE-AMP. BRACKET as instructed in 5-1.
2) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
3) Remove the two screws ① and the other one ⑩, then remove the COMPL HOLDER MOTOR ② (see Fig. 5-3-1.).

2. Remounting

1) Set the mechanism chassis to the INITIAL mode. In this mode, look at the mechanism chassis positioning holes ③ just from above and align the MAIN CAM ④ and MODE CAM ⑤ positioning holes as shown in Fig. A.
2) Set the COMPL HOLDER MOTOR ② to the INITIAIL mode with the mode selector (VHJ-0050). In this position, the FRONT LOADING GEAR △ mark ⑥ is aligned with the MOTOR HOLDER INITIAL mode position mark ⑦ (see Fig. B.).
3) Align the ROTARY SWITCH (mode detector switch) ⑧ with the INITIAL mode position mark ⑨ (see Fig. C.).
4) Align the COMPL HOLDER MOTOR main unit ② with the protuberance ⑪, then mount it with the two screws ① and the other one ⑩.
5) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
6) Mount the PRE-AMP UNIT and the PRE-AMP. BRACKET as instructed in 5-1.

Note : Normal mechanism operation cannot be achieved if initial positioning of the MAIN CAM ④, the MODE CAM ⑤ and the ROTARY SWITCH (mode detector switch) ⑧ are not performed precisely.



①Screw
Loading motor
⑫Positioning Alignment Holes
⑩Screw
Fig. B
②COMPL HOLDER MOTOR
Fig. A
④Main Cam
③INITIAL Mode Positioning Alignment Holes
⑥△ Positioning Alignmet Mark
⑦INITIAL mode Positioning Alignment Mark
⑤Mode Cam
⑪Protuberance
⑪Protuberance
Fig. C
Bottom view of Compl Motor Bracket
⑧ Rotary Switch
⑨INITINAL Positioning Alignment Marks
⑫Positioning Alignment Holes

Fig. 5-3-1 Compl Holder Motor

5-3-2. Loading Motor (Refer to Fig. 5-3-2.)

1. Removal

LOADING MOTOR can be replaced after LOADING MOTOR BLOCK unit has been removed by referring to 5-3-1. The 1990 version of the mechanism allows LOADING MOTOR itself to be replaced without removing CASSETTE HOLDER BLOCK and LOADING MOTOR BLOCK. The following describes this procedure.

1) Use MODE SELECTOR (VHJ-0050) to set the mechanism to the initial mode.
2) Remove the connector for DEW SENSOR connected to the MC-3 board ①.
3) Remove three screws ② and remove HOLDER BRACKET ④ with FRONT WORM ASS'Y ③ still attached.
4) Remove DAMPER ⑥ attached to the pulley of LOADING MOTOR ⑤.
5) Remove FRONT HELICAL GEAR ⑦ and WASHER ⑧.
6) Remove soldered LEAD WIRE from the terminal of LOADING MOTOR ⑤.
7) Remove LOADING BELT ⑨.
8) Remove LOADING MOTOR ⑤ by lifting up from the back terminal side.

2. Remounting

Before attaching LOADING MOTOR ⑤ to MOTOR BRACKET ASS'Y ⑩, confirm DAMPER ⑪ and DAMPER ⑫ shown in Fig. 5-3-5. are in the proper position on MOTOR BRACKET ASS'Y ⑩.

1) LOADING MOTOR ⑤ puts REAR SIDE BOSS ㉓ in the slit ㉔ of MOTOR HOLDER ⑩.
   Further, mount the tap hole ⑬ at two points of the front pulley side so that the it is secured to the PROTUBERANCE ⑭ of the MOTOR HOLDER at two points.
2) Solder the lead wire from the MC-3 board to LOADING MOTOR ⑤ terminal. (Solder the red lead wire to the positive terminal side.)
3) Hang LOADING BELT ⑨ on the pulley.
4) After hanging BELT ⑨ on the pulley, confirm that the mechanism unit is in the initial mode. The initial mode is indicated by Fig. A of Fig. 5-3-2., and is the position in which INITIAL POSITIONING ALIGNMENT HOLEs of MAIN CAM ⑮ and MODE CAM ⑯ are lined up with THROUGH HOLE ⑰ of MOTOR HOLDER. If the initial mode is not selected, adjust with MODE SELECTOR (VHJ-0050).
5) As shown in Fig. B, confirm the positions of the △ POSITIONING ALIGNMENT MARK on FRONT LOAD GEAR ⑱ and INITIAL MARK ⑲ position of MOTOR HOLDER and the position relationship of CASSETTE HOLDER RACK ⑳.
6) Apply a light coat of grease to the entire sides of AXLE ㉑ and FRONT HELICAL GEAR ⑦.
7) Attach FRONT HELICAL GEAR ⑦ and WASHER ⑧ to AXLE ㉑. As shown in Fig. C, FRONT HELICAL GEAR ⑦ is attached so that the indent on the side is inside PIN ㉒ of FRONT LEVER ASS'Y.
8) Attach DAMPER ⑥ to LOADING MOTOR ⑤ pulley.
9) HOLDER BRACKET ④ is attached by engaging FRONT WORM ASS'Y ③ with LOADING MOTOR ⑤ pulley, and held in place with three screws ②.
10) Attach the connector of DEW SENSOR ㉕ to the MC-3 board ① and return the mechanism to the eject completion using MODE SELECTOR.

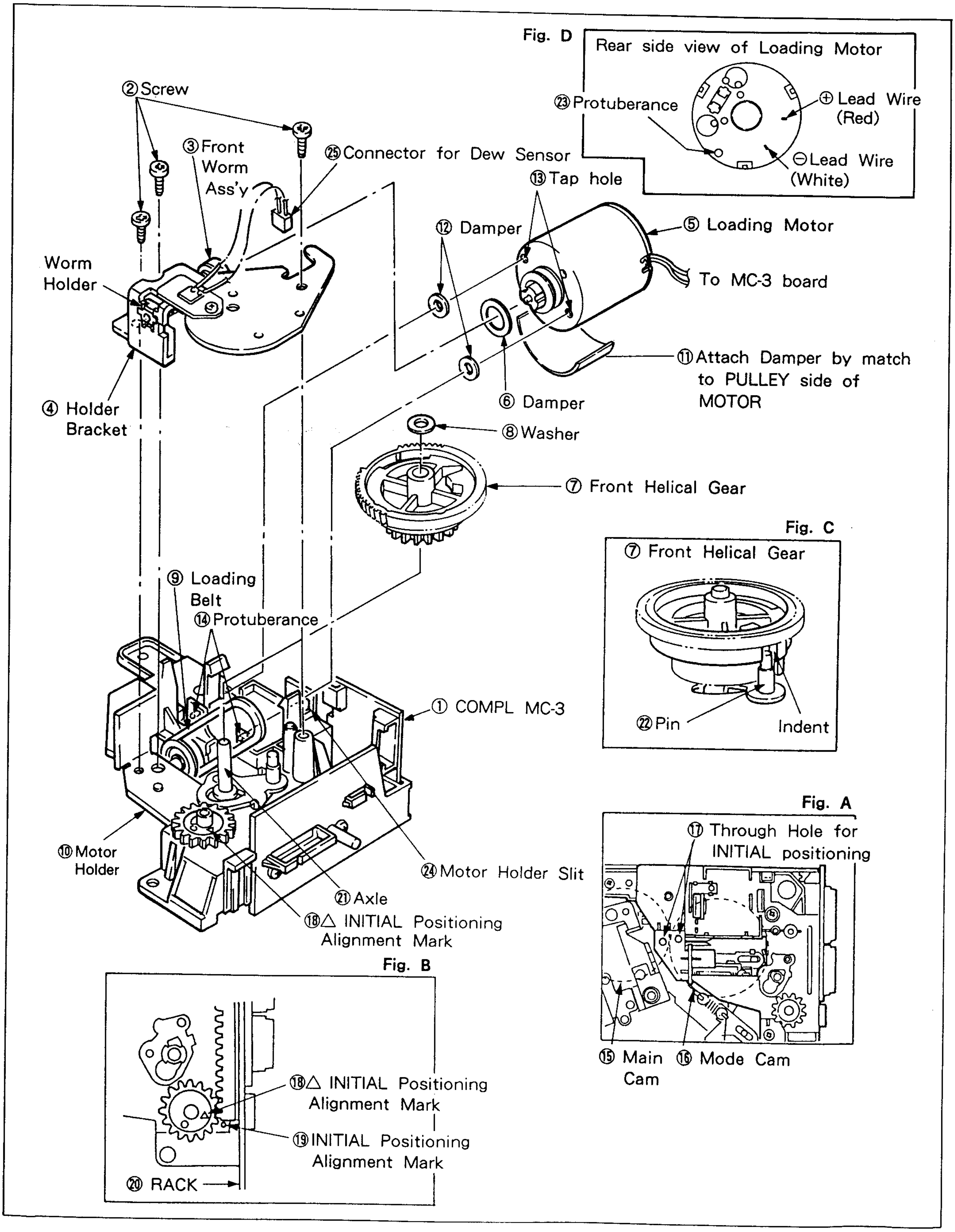


Fig. D
Rear side view of Loading Motor
㉓Protuberance
⊕ Lead Wire (Red)
⊖Lead Wire (White)
②Screw
③Front Worm Ass'y
㉕Connector for Dew Sensor
⑬Tap hole
⑫ Damper
⑤ Loading Motor
To MC-3 board
Worm Holder
⑪Attach Damper by match to PULLEY side of MOTOR
④ Holder Bracket
⑥ Damper
⑧Washer
⑦ Front Helical Gear
Fig. C
⑦ Front Helical Gear
㉒Pin
Indent
⑨ Loading Belt
⑭Protuberance
① COMPL MC-3
⑩Motor Holder
㉔Motor Holder Slit
㉑Axle
⑱△ INITIAL Positioning Alignment Mark
Fig. A
⑰ Through Hole for INITIAL positioning
⑮ Main Cam
⑯ Mode Cam
Fig. B
⑱△ INITIAL Positioning Alignment Mark
⑲INITIAL Positioning Alignment Mark
⑳ RACK

Fig. 5-3-2. Loading Motor

5-4. TAPE LOADING MECHANISM

5-4-1. Main Parts of the Tape Loading Mechanism (See Fig. 5-4-1.)

1. Removal

1) Remove connectors from the DRUM MOTOR board (SV-5).
2) Remove the three screws ①, then remove the REINFORCE BRACKET ②.
3) Remove the two special washers ③, then remove the LOAD RACK ④.
4) Remove the special washer ⑤, then remove the CAM LOAD LEVER ASS'Y ⑥.
5) Remove the stop washer ⑦, then remove the MAIN CAM ⑧.
6) Unhook the LOAD GEAR T hook ⑩, then remove the LOAD GEAR T ⑨ as shown in Fig. A, with the SPRING COIL ⑪ and the LOAD LEVER ASS'Y T ⑫ attached to it.
7) Unhook the LOAD GEAR S hook ⑭, then remove the LOAD GEAR S ⑬ as shown in Fig. B, with the SPRING COIL S ⑮ and the LOAD LEVER ASS'Y S ⑯ attached to it.

Note : Take care not to open the LOAD GEAR hooks too much, otherwise they may be deformed or broken. If they are, replace them.

2. Remounting

1) Apply grease to the inner surface of the LOAD LEVER ASS'Y S ⑯ hole ⑰, as shown in Fig. B.
2) Apply grease to the inner surface of the LOAD LEVER ASS'Y T ⑫ hole ㉒ and to the section of the LOAD GEAR T ⑨ indicated with an arrow in Fig. C.
3) Apply grease to GROOVEs 1 and 2 of the MAIN CAM ⑧, and to the outer side of the teeth.
4) Apply grease to the three oval holes of the LOAD RACK ④ as shown in Fig. D.
5) Apply grease to the outer surface of axles ⑲ ⑳㉖ and ㉘.
6) After assembling as shown in Fig. B, mount the LOAD GEAR S ⑬ onto the axle ⑲. Insert the ROLLER BASE S pin ⑱ into the LOAD LEVER ASS'Y S hole ⑰.
7) After assembling as shown in Fig. A, mount the LOAD GEAR T ⑨ onto the axle ⑳. When doing so, set the LOAD GEAR S ⑬ and the LOAD GEAR T ⑨ to the INITIAL mode position ㉑. Insert the ROLLER BASE T pin ㉓ into the hole ㉒ of the LOAD LEVER ASS'Y T ⑫.
8) Mount the MAIN CAM ⑧ on the axle ㉖. At that time, make sure that the positioning hole ㉕ of the MAIN CAM ⑧ and the MODE CAM ㉔ matches the initial positioning hole ㉞ of the MECHANISM CHASSIS. Also check to be sure that the Pin ㉗ of the CAM PINCH LEVER ASS'Y is put in the groove 1 of the MAIN CAM as shown in Fig. E.
9) Mount the special washer ⑦ to the axle ㉖.
10) Mount the CAM LOAD LEVER ASS'Y ⑥ onto the axle ㉘. Insert the pin ㉙ into the MAIN CAM GROOVE 2 as shown in Fig. E.
11) Mount the special washer ⑤ onto the axle ㉘.
12) Set the LOAD RACK ④ to the INITIAL mode position ㉚ with the LOAD GEAR T ⑨, and mount onto the two axles ㉛. Insert the CAM LOAD LEVER ASS'Y pin ㉝ into the hole ㉜.
13) Mount the two special washers ③ onto the two axles ㉛.
14) Mount the REINFORCE BRACKET ② with the three screws ①.
15) Insert the connector into the DRUM MOTOR board (SV-5).
16) Confirm that loading and unloading are performed smoothly.

Note : Be sure to perform INITIAL mode positioning of cams and gears precisely.

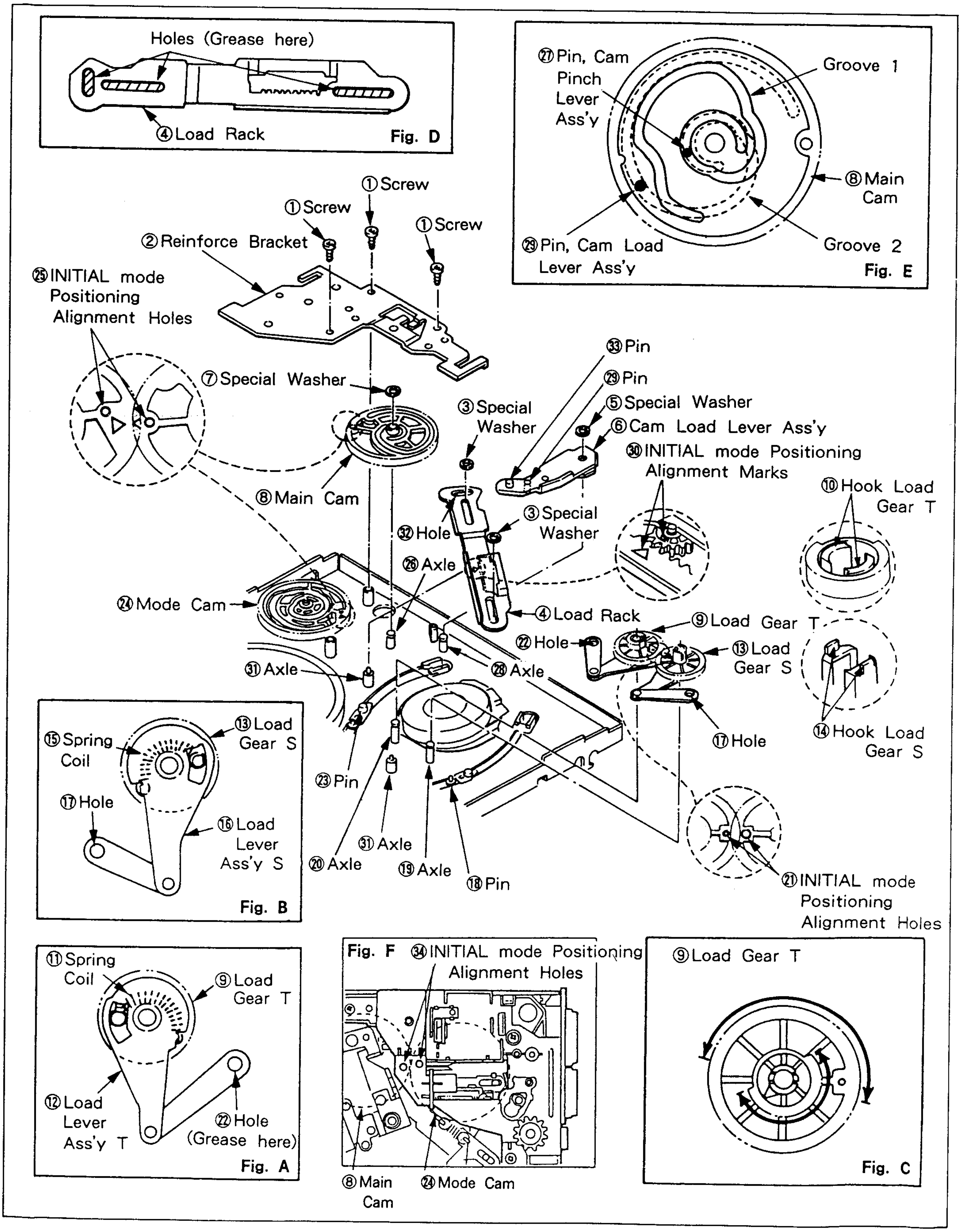

Holes (Grease here)
④Load Rack
Fig. D
㉗Pin, Cam Pinch Lever Ass'y
Groove 1
⑧Main Cam
㉙Pin, Cam Load Lever Ass'y
Groove 2
Fig. E
①Screw
①Screw
①Screw
②Reinforce Bracket
㉕INITIAL mode Positioning Alignment Holes
⑦Special Washer
⑧Main Cam
㉝Pin
㉙Pin
③Special Washer
⑤Special Washer
⑥Cam Load Lever Ass'y
㉚INITIAL mode Positioning Alignment Marks
⑩Hook Load Gear T
㉜Hole
③Special Washer
㉖Axle
㉔Mode Cam
④Load Rack
⑨Load Gear T
㉒Hole
⑬Load Gear S
㉘Axle
㉛Axle
⑰Hole
⑭Hook Load Gear S
⑮Spring Coil
⑬Load Gear S
⑰Hole
⑯Load Lever Ass'y S
Fig. B
㉓Pin
㉛Axle
⑳Axle
⑲Axle
⑱Pin
㉑INITIAL mode Positioning Alignment Holes
⑪Spring Coil
⑨Load Gear T
⑫Load Lever Ass'y T
㉒Hole (Grease here)
Fig. A
Fig. F
㉞INITIAL mode Positioning Alignment Holes
⑧Main Cam
㉔Mode Cam
⑨Load Gear T
Fig. C

Fig. 5-4-1. Loading Mechanism Main Parts

5-4-2. Mode Cam (See Fig. 5-4-2.)

1. Removal

1) Set the INITIAL mode with the mode selector (VHJ-0050).
2) Remove the REINFORCE BRACKET as instructed in 5-4-1.
3) Remove the two stop washers ①, then remove the CAM PLATE SLIDE ASS'Y ②.
4) Remove the MODE CAM ③.

2. Remounting

1) Referring to 5-4-1., confirm that the MAIN CAM is in the INITIAL mode position.
2) In case the MAIN CAM is misplaced, use the mode selector (VHJ-0050) to align the MAIN CAM positioning hole with the chassis INITIAL mode position hole (refer to 5-4-1. for the INITIAL mode position). Since the ROTARY SWITCH (mode detector switch) does not rotate, the mode selector indicator lamp will not show the correct mode.
3) Align the ROTARY SWITCH (mode detector switch) ④ with the INITIAL mode position mark ⑤ as shown in Fig. A.
4) Mount the MODE CAM ③ onto the axle ⑥. Do it so that the SLIDE CAM ASS'Y pin ⑪ is placed in the GROOVE 3 as shown in Fig. B.
5) Mount the CAM PLATE SLIDE ASS'Y ② onto the axles ⑥ and ⑦. Do it so that the pin ⑧ gets into the GROOVE 4 of the MODE CAM as shown in Fig. B, and the point ⑨ of the bent-up part into the ACT PLATE SLIDE ASS'Y hole ⑩.
6) Mount the two special washers ① onto the axles ⑥ and ⑦.
7) Mount the REINFORCE BRACKET as instructed in 5-4-1.

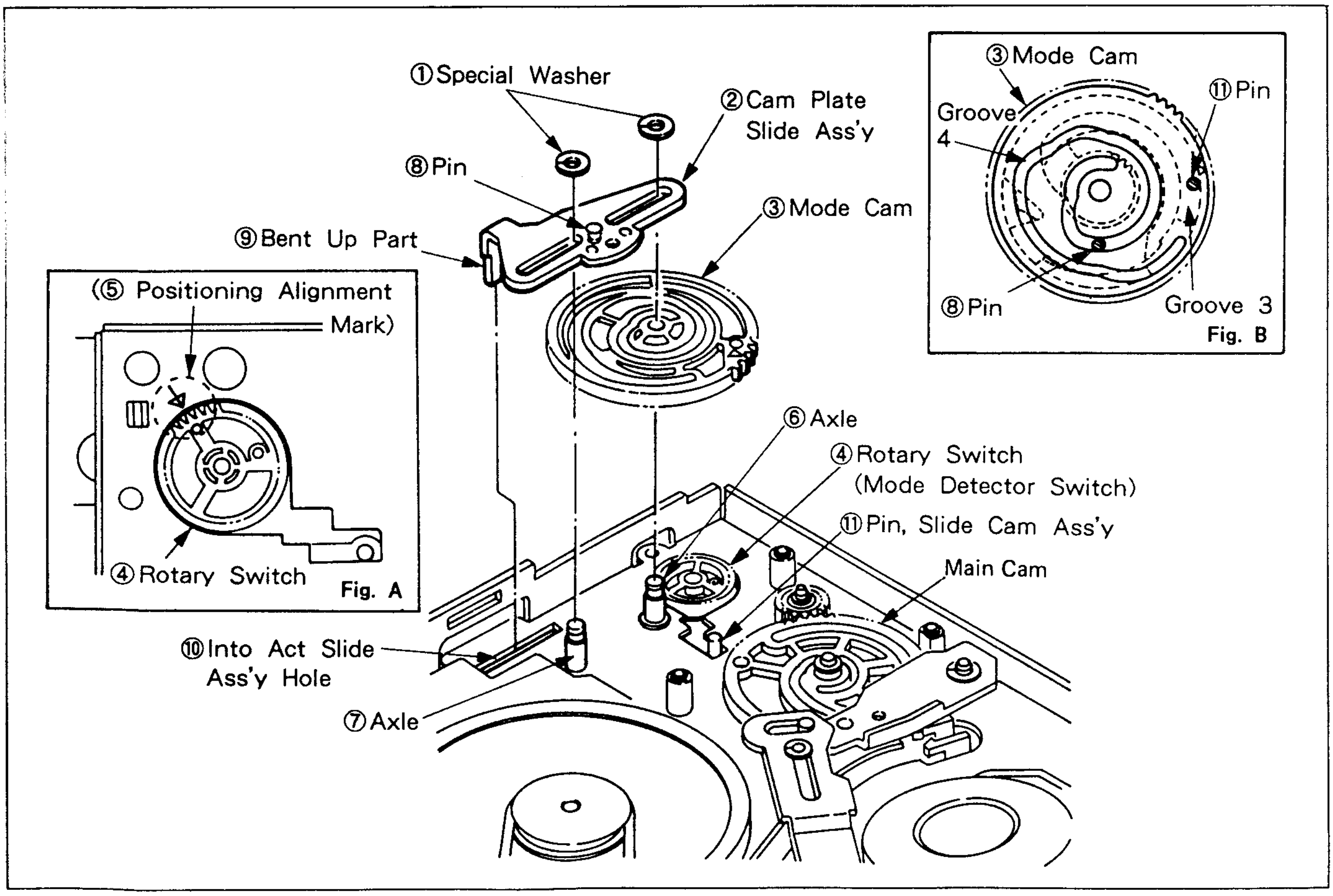

①Special Washer
②Cam Plate Slide Ass'y
⑧Pin
③Mode Cam
⑨Bent Up Part
(⑤ Positioning Alignment Mark)
④Rotary Switch
Fig. A
③Mode Cam
Groove 4
⑪Pin
⑧Pin
Groove 3
Fig. B
⑥Axle
④Rotary Switch (Mode Detector Switch)
⑪Pin, Slide Cam Ass'y
Main Cam
⑩Into Act Slide Ass'y Hole
⑦Axle

Fig. 5-4-2. Mode Cam

5-5. COMPL HEAD BRACKET (ACE HEAD) (See Fig. 5-5-1.)

1. **Removal**
1) Remove the COMPL HEAD BRACKET special mounting nut ②.
2) Remove the SLEEVE ③, the COMPL HEAD BRACKET ① and the ACE HEAD SPRING COIL ④, in that order.

Note : Take care not to scratch or soil the ACE head surface.

2. **Remounting**
1) Apply grease to the axle ⑥ as shown in Fig. A.
2) Apply grease to the spot where the COMPL HEAD BRACKET ① makes contact with the STOPPER ⑦ (See Fig. A).
3) Mount the ACE HEAD SPRING COIL ④ and the COMPL HEAD BRACKET ①, in that order, onto the axle ⑥. Hook one end of the ACE HEAD SPRING COIL ④ to the notch ⑤, and the other end to the COMPL HEAD BRACKET, so that the COMPL HEAD BRACKET is pressed against the STOPPER ⑦ (See Fig. A).
4) Mount the SPECIAL NUT ② onto the axle ⑥ through the SLEEVE ③.
5) Clean the ACE head surface with a chamois leather moistened with methyl alcohol.
6) Perform ACE head adjustment as instructed in 6-4.

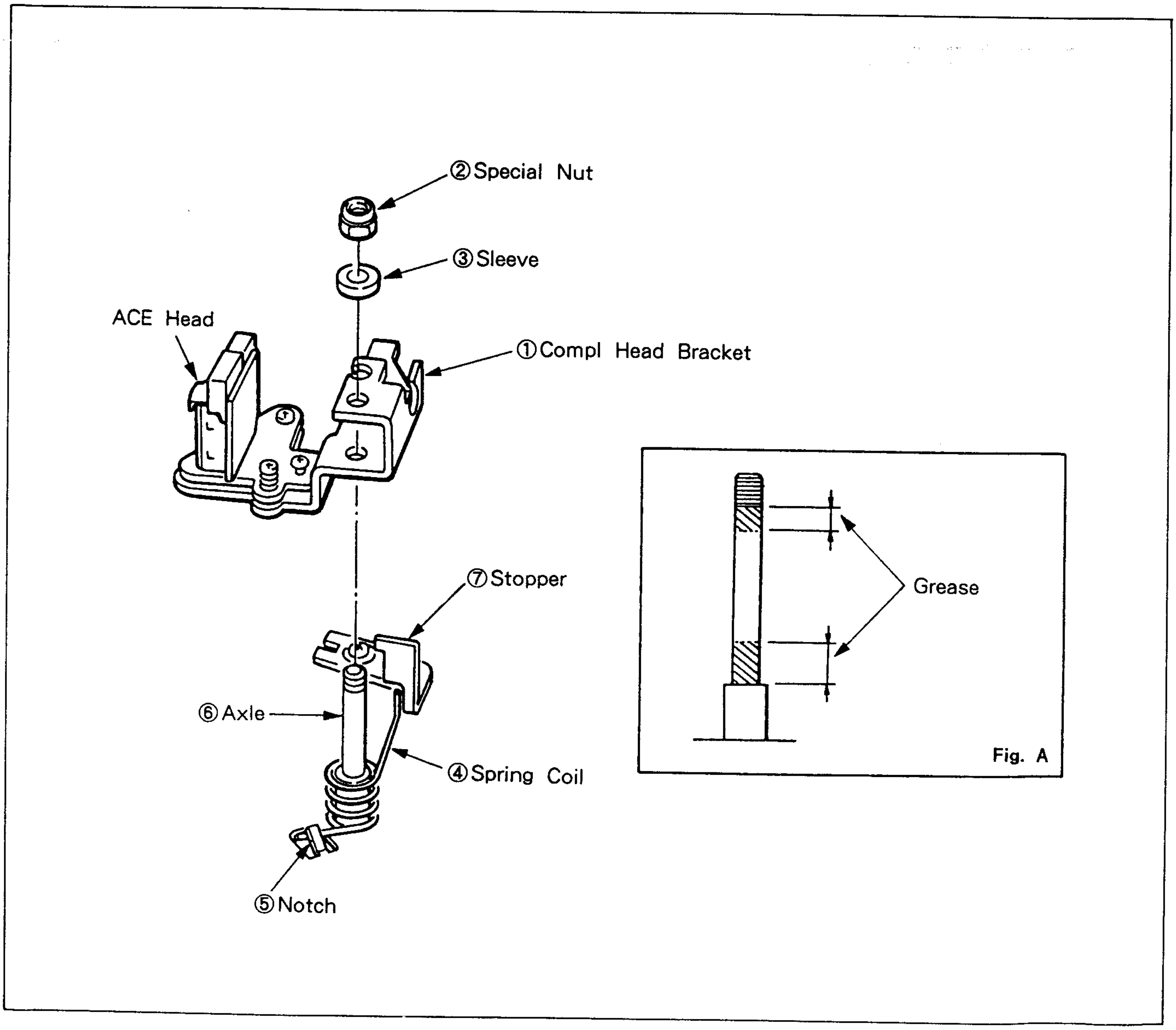

②Special Nut
③Sleeve
ACE Head
①Compl Head Bracket
⑦Stopper
⑥Axle
④Spring Coil
⑤Notch
Grease
Fig. A

Fig. 5-5-1. Compl Head Bracket (ACE Head)

5-6. PINCH ROLLER PRESSURE MECHANISM (See Fig. 5-6-1.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the COMPL HEAD BRACKET as instructed in 5-5.
3) Remove the PINCH SPRING COIL ①.
4) Remove the special washer ②, then remove the PINCH LEVER ASS'Y ③.
5) Remove the REV GUIDE LEVER SPRING COIL ④.
6) Remove the REV GUIDE LEVER ASS'Y ⑥ from the hook ⑤ of the plastic molding bearing on the bottom side. Use a jig VHJ-0073 shown in Fig. 5-6-2 to widen the hook ⑤ of the plastic molding bearing. By so doing, the above removal of the REV GUIDE LEVER ASS'Y ⑥ can be made more easily. Care should be taken to avoid pushing the jig VHJ-0073 too much. Pushing it too hard may damage the hook in an extreme case.
7) Remove the LINK LOCK SPRING COIL ⑦.
8) Remove the special washer ⑧, then remove the PINCH CAM LEVER ASS'Y ⑨.
9) Remove the ACT PINCH SLIDE ASS'Y ⑩.

Note : If damaged the claw ⑤ of the plastic bearing, reference should be made to Section 3. "Method of Repairing the Bearing Section of REV GUIDE LEVER ASSEMBLY".

2. Remounting

1) Apply grease to pins ⑫/⑬ and axles ⑯/⑱.
2) Apply grease to the ACT PINCH SLIDE ASS'Y pin ⑰.
3) Set the INITIAL mode with the mode selector (VHJ-0050).
4) Mount the ACT PINCH SLIDE ASS'Y ⑩ onto pins ⑫ and ⑬.
5) Insert the pin ⑭ of the PINCH CAM LEVER ASS'Y ⑨ into the MAIN CAM ⑪ GROOVE 1, and mount onto the axle ⑯ while inserting the pin ⑰ of the ACT PINCH SLIDE ASS'Y into the hole ⑮.
6) Mount the special washer ⑧ onto the axle ⑯.
7) Hook the LINK LOCK SPRING COIL ⑦ to the PINCH CAM LEVER ASS'Y ⑨.
8) Mount the REV GUIDE LEVER ASS'Y ⑥ to the plastic molding bearing, then fix it with the hook ⑤ at the bottom.
9) Hook the REV GUIDE LEVER SPRING COIL ④.
10) Mount the PINCH LEVER ASS'Y ③ to the axle ⑱.
11) Mount the special washer ② to the axle ⑱.
12) Hook the PINCH SPRING COIL ① between the ACT PINCH SLIDE ASS'Y ⑩ and the PINCH LEVER ASS'Y ③.
13) Mount the COMPL HEAD BRACKET as instructed in 5-5.
14) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
15) Perform ACE head adjustment as instructed in 6-4.

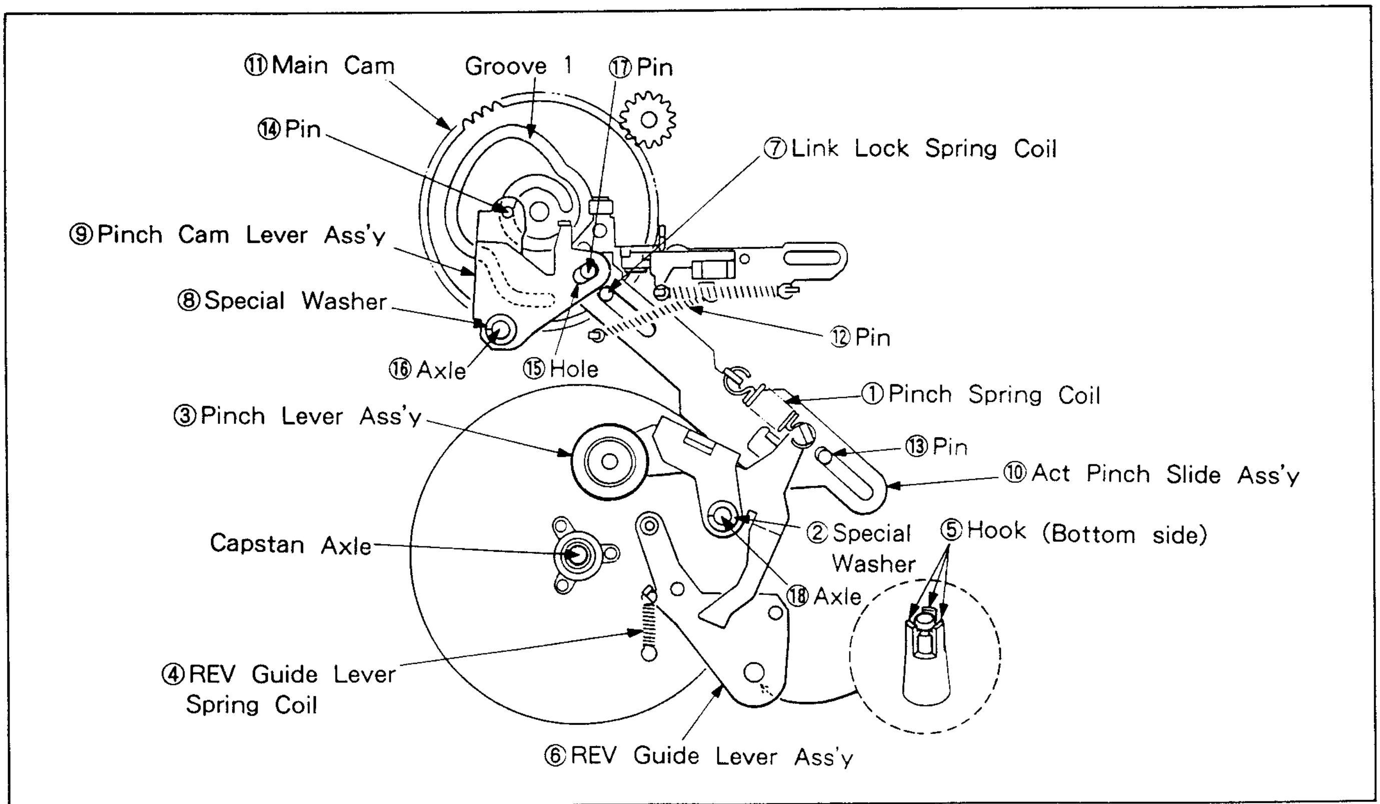
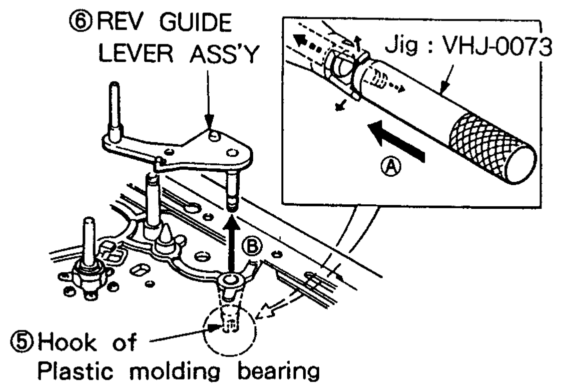

⑪Main Cam
Groove 1
⑰Pin
⑭Pin
⑦Link Lock Spring Coil
⑨Pinch Cam Lever Ass'y
⑧Special Washer
⑫Pin
⑯Axle
⑮Hole
①Pinch Spring Coil
③Pinch Lever Ass'y
⑬Pin
⑩Act Pinch Slide Ass'y
Capstan Axle
②Special Washer
⑤Hook (Bottom side)
⑱Axle
④REV Guide Lever Spring Coil
⑥REV Guide Lever Ass'y

Fig. 5-6-1. Pinch Roller Pressing Mechanism


⑥REV GUIDE
LEVER ASS'Y
Jig : VHJ-0073
Ⓐ
Ⓑ
⑤Hook of
Plastic molding bearing

Remove REV GUIDE LEVER ASS'Y in the direction of arrow Ⓑ, pushing VHJ-0073 slightly in the direction of arrow Ⓐ.
Be careful not to damage the hook by pushing too much.

Fig. 5-6-2 Method of Using the Jig VHJ-0073

3. Method of Repairing the Bearing Section of REV GUIDE LEVER ASS'Y

If the hook of the plastic molding bearing is damaged in the process of removing the REV GUIDE LEVER ASS'Y, proceed with the repair as follows :

1) Scrape the broken hook of the bearing section with a cutter knife and flatten it.
2) Insert the REV GUIDE LEVER ASS'Y in the bearing and fit a stopper washer in. The special washer to be used must be Part No. 411 109 1605. This stop washer (Part No. 411 109 1605) is the same as that used on SUPPLY REEL ASS'Y or TAKE-UP REEL ASS'Y.
   Remove the REV GUIDE LEVER ASS'Y toward an arrow B while pushing the jig VHJ-0073 lightly in the direction of an arrow.

Pushing the jig VHJ-0073 too much may cause hook breakage. Therefore, care should be taken.

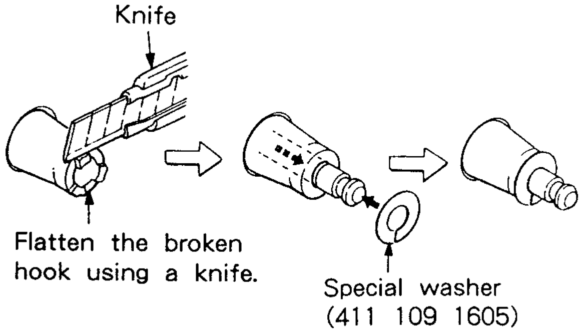

Knife
Flatten the broken
hook using a knife.
Special washer
(411 109 1605)

Fig. 5-6-3 Method of Repairing the Bearinig Section of the REV GUIDE LEVER ASS'Y

5-7. BRAKE MECHANISM

5-7-1. Sub Take-up Brake Ass'y (See Fig. 5-7-1.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the SPRING COIL ①.
3) While pushing the hook ② in the direction of arrow, remove the SUB TAKE-UP BRAKE ASS'Y ③.

2. Remounting

1) Mount the SUB TAKE-UP BRAKE ASS'Y ③ onto the pin ④. Confirm that the hook ② is firmly hooked to the chassis.
2) Fit the SPRING COIL between hooks ⑤ and ⑥.
3) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.

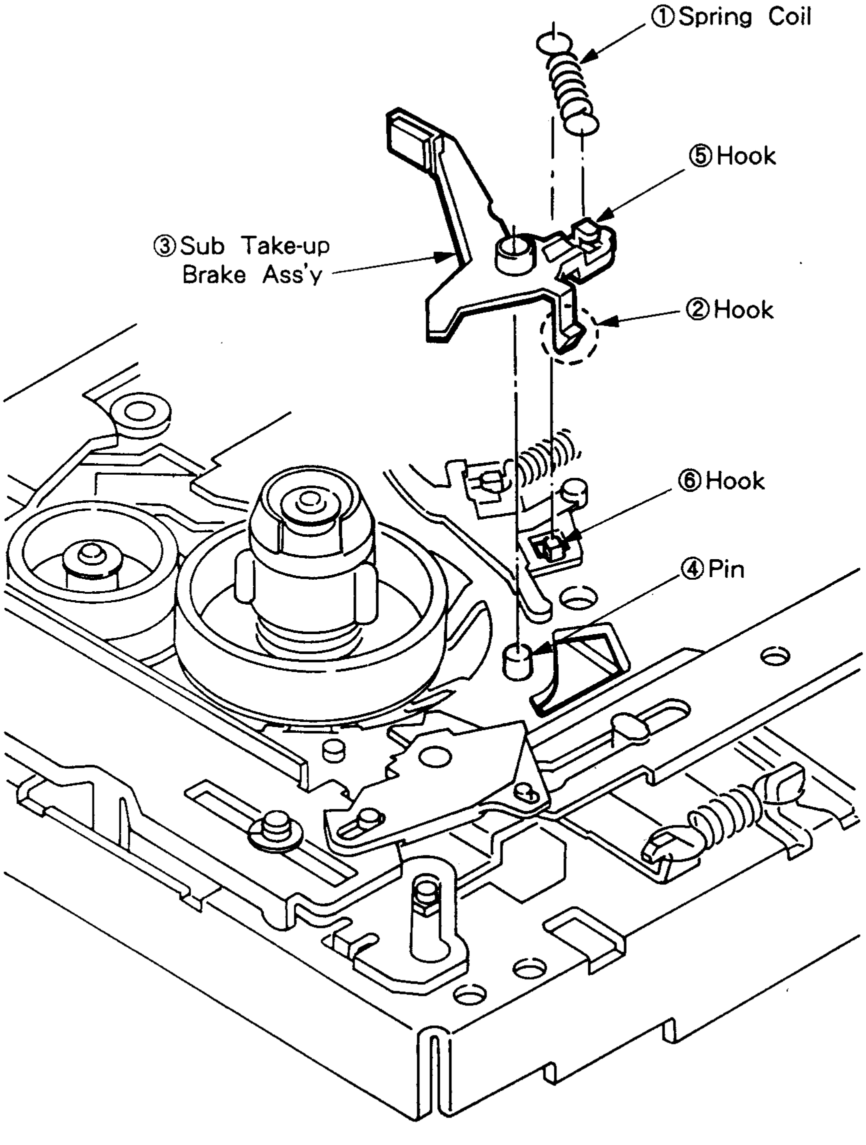

①Spring Coil
⑤Hook
③Sub Take-up Brake Ass'y
②Hook
⑥Hook
④Pin

Fig. 5-7-1. Sub Take-up Brake Ass'y

5-7-2. Supply Brake Ass'y and Take-up Brake Ass'y (See Fig. 5-7-2.)

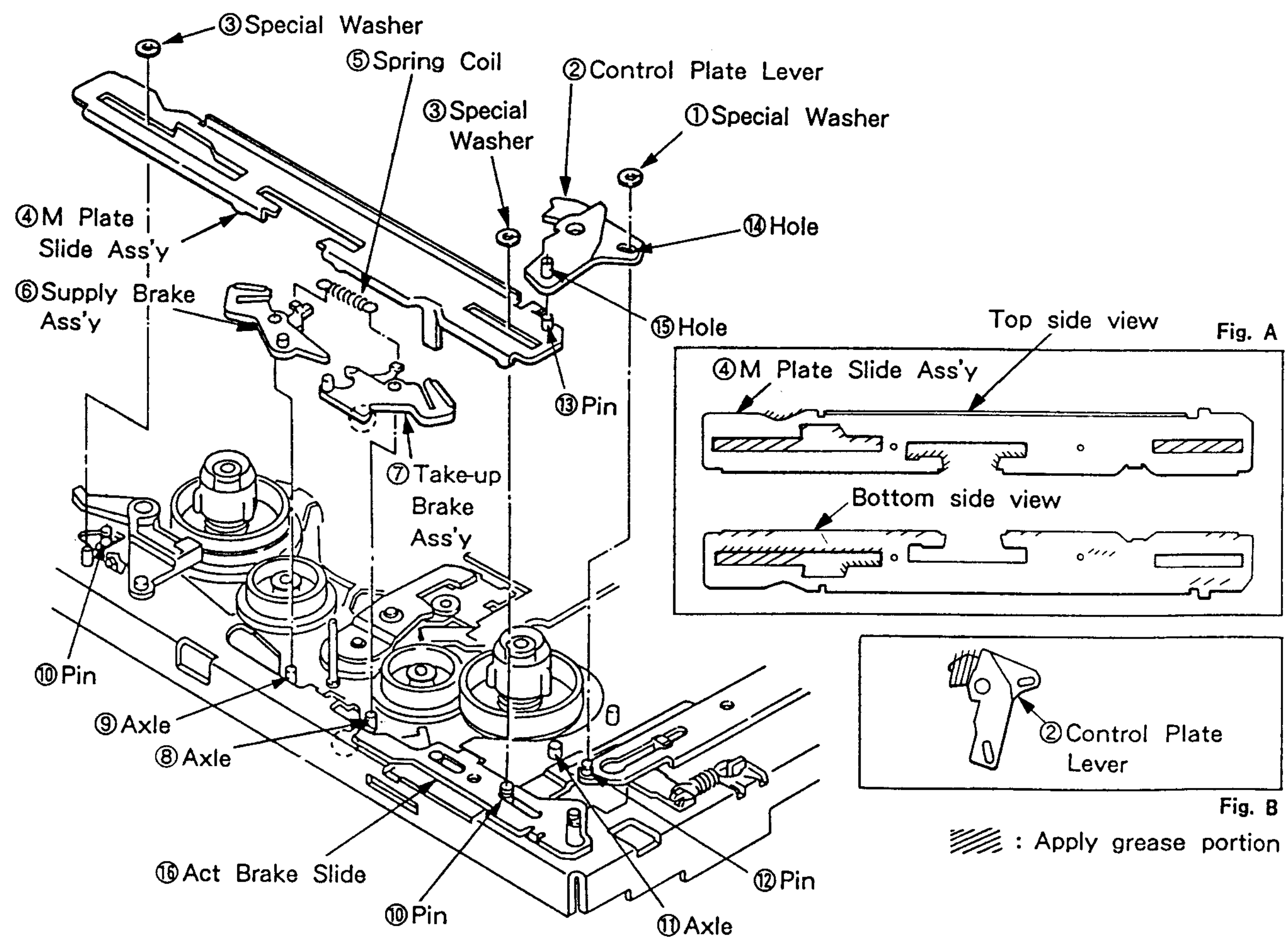
1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the SUB TAKE-UP BRAKE as instructed in 5-7-1.
3) Remove the special washer ①, then remove the CONTROL PLATE LEVER ②.
4) Remove the two special washers ③, then remove the M PLATE SLIDE ASS'Y ④.
5) Remove the SPRING COIL ⑤.
6) Remove the SUPPLY BRAKE ASS'Y ⑥ and the TAKE-UP BRAKE ASS'Y ⑦.

Note : Take care not to soil the brake shoes.

2. Remounting

1) Apply a thin layer of grease to axles ⑧ and ⑨.
2) Mount the TAKE-UP BRAKE ASS'Y ⑦ onto the axle ⑧.
3) Mount the SUPPLY BRAKE ASS'Y ⑥ onto the axle ⑨.
4) After applying a thin layer of grease to the M PLATE SLIDE ASS'Y ④ as shown in Fig. A, mount it onto the two pins ⑩.
5) Mount the two special washers ③ onto the two pins ⑩.
6) After applying grease to the CONTROL PLATE LEVER ② as shown in Fig. B, mount it onto the axle ⑪. Insert the ACT PLATE SLIDE ASS'Y pin ⑫ into the hole ⑭, and the M PLATE SLIDE ASS'Y pin ⑬ into the hole ⑮.
7) Mount the special washer ① onto the pin ⑫.
8) Mount the SUB TAKE-UP BRAKE as instructed in 5-7-1.
9) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.


③Special Washer
⑤Spring Coil
②Control Plate Lever
③Special Washer
①Special Washer
④M Plate Slide Ass'y
⑭Hole
⑥Supply Brake Ass'y
⑮Hole
⑬Pin
⑦Take-up Brake Ass'y
⑩Pin
⑨Axle
⑧Axle
⑯Act Brake Slide
⑩Pin
⑫Pin
⑪Axle
Top side view
Fig. A
④M Plate Slide Ass'y
Bottom side view
②Control Plate Lever
Fig. B
▨ : Apply grease portion

When assembling, the contact surfaces of Take-up Brake ⑦ and the Brake Slide ⑯ marked with ◌ should contact but not overlap each other.

Fig. 5-7-2. Supply Brake Ass'y & Take-up Brake Ass'y

5-7-3. Tension Lever Ass'y and Band Holder Ass'y (See Fig. 5-7-3.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the SPRING COIL ①.
3) Remove the screw ③ fixing the BAND HOLDER ASS'Y ②.
4) Push the SUB SUPPLY BRAKE ④ in the direction of the arrow A, setting the BAND HOLDER ASS'Y ② free.
5) Open the hook ⑤ a little and remove the TENSION LEVER ASS'Y ⑥. Take care not to open the hook ⑤ too much, otherwise it may be deformed or broken.
6) Remove the hook ⑦ of the BAND HOLDER ASS'Y.

2. Remounting

1) Mount the BAND HOLDER ASS'Y hook ⑦ into the TENSION LEVER ASS'Y hole ⑧.
2) Insert the TENSION LEVER ASS'Y axle ⑨ into the hole ⑩ and confirm that the hook ⑤ is hooked.
3) While pushing the SUB SUPPLY BRAKE ④ in the direction of arrow A, mount the BAND HOLDER ASS'Y ② with the screw ③.
4) Hook the SPRING COIL ① between the hooks ⑪ and ⑫.
5) Perform TENSION POLE position adjustment as instructed in 6-3.
6) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.

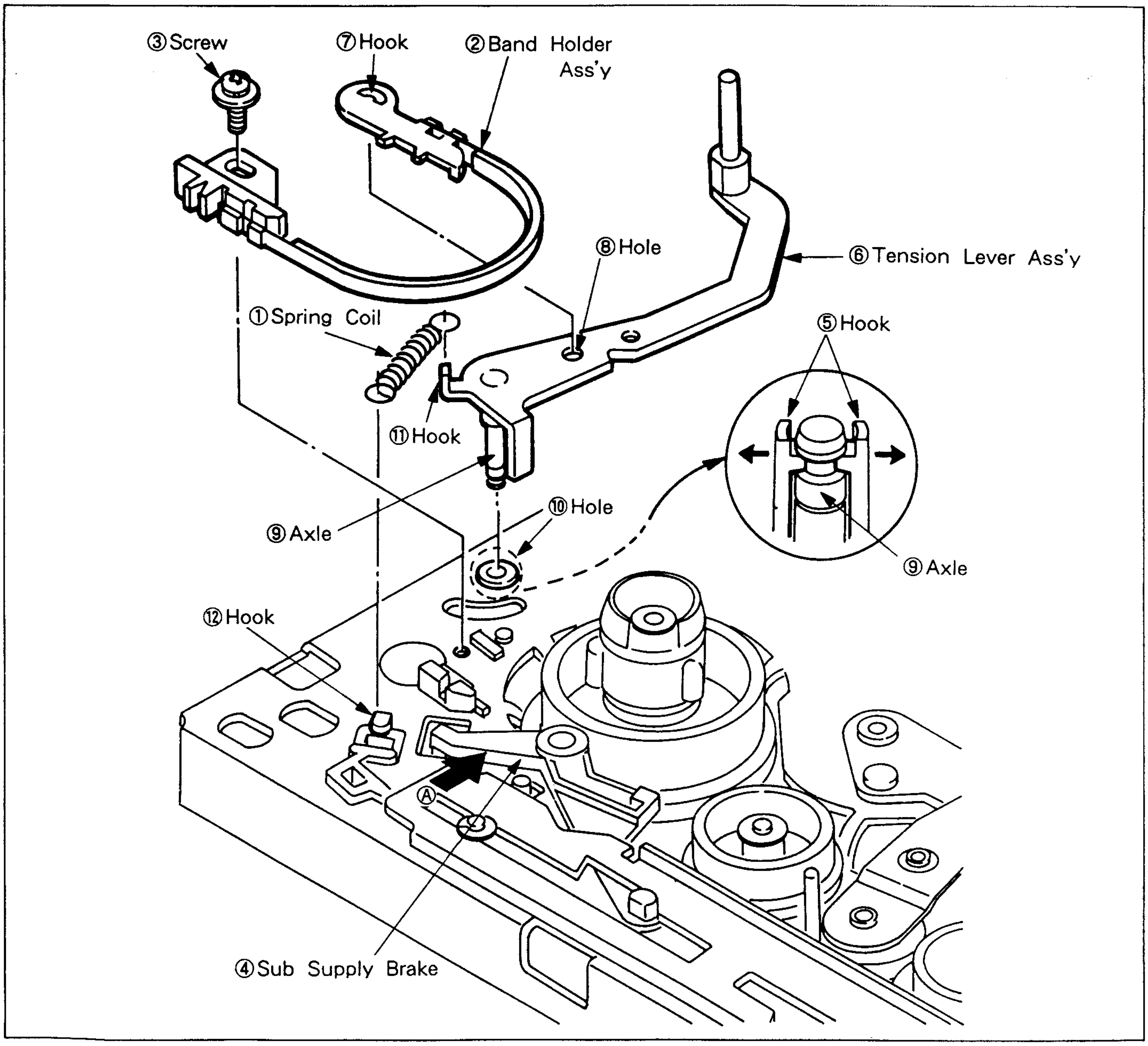

③Screw
⑦Hook
②Band Holder Ass'y
⑧Hole
⑥Tension Lever Ass'y
①Spring Coil
⑤Hook
⑪Hook
⑨Axle
⑩Hole
⑨Axle
⑫Hook
Ⓐ
④Sub Supply Brake

Fig. 5-7-3. Tension Lever Ass'y & Band Holder Ass'y

5-7-4. Capstan Brake Ass'y (See Fig. 5-7-4.)

1. Removal

1) Remove the SPRING COIL ①.
2) Unhook the hook ②, then remove the CAPSTAN BRAKE ASS'Y ③.

2. Remounting

1) Mount the CAPSTAN BRAKE ASS'Y ③ onto the axle ④. Confirm that the hook ② is hooked to the chassis.
2) Hook the SPRING COIL ① between hooks ⑤ and ⑥. Fix the hook ⑥ side with adhesive (use an adhesive that allows later detaching).

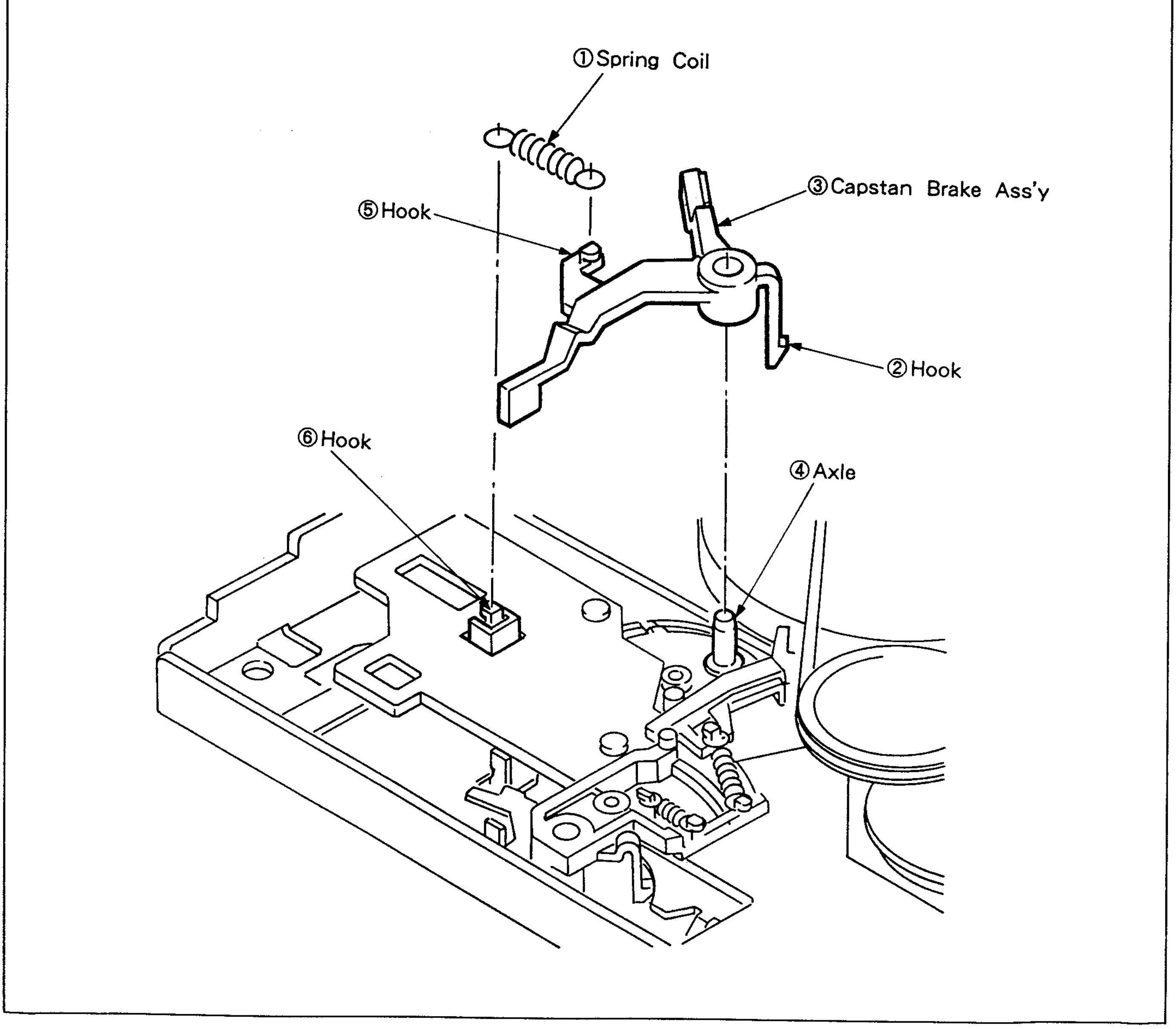

①Spring Coil
③Capstan Brake Ass'y
⑤Hook
②Hook
⑥Hook
④Axle

Fig. 5-7-4. Capstan Brake Ass'y

5-8. REEL TABLE DRIVE MECHANISM

5-8-1. Supply Reel Ass'y and Supply Reel Gear (See Fig. 5-8-1.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the BAND HOLDER ASS'Y as instructed in 5-7-3.
3) Set the PLAY mode with the mode selector (VHJ-0050).
4) Remove the special washer ①, then remove the SUPPLY REEL ASS'Y ② and the washer ③.
5) Remove the special washer ④.
6) While pushing the SUPPLY BRAKE ASS'Y ⑤ in the direction of arrow A, remove the SUPPLY REEL GEAR ⑥ and the washer ⑦.

Note : Be sure that no dirt gets on the section where both brake shoes make contact.

2. Remounting

1) Apply a little oil (less than one drop) to the part of the axle ⑧ indicated by the arrow B, then mount the washer ⑦.
2) While pushing the SUPPLY BRAKE ASS'Y ⑤ in the direction of arrow A, mount the SUPPLY REEL GEAR ⑥ onto the axle ⑧.
3) Mount the special washer ④ to the axle ⑧.
4) Apply 1 drop of oil to the part of the axle ⑨ indicated by the arrow C, then mount the washer ③.
5) Mount the SUPPLY REEL ASS'Y ② onto the axle ⑨.
6) Perform reel table height adjustment as instructed in 6-2-1.
7) Mount the special washer ① onto the axle ⑨.
8) Mount the BAND HOLDER ASS'Y as instructed in 5-7-3.
9) Perform tension pole position adjustment as instructed in 6-3.
10) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.

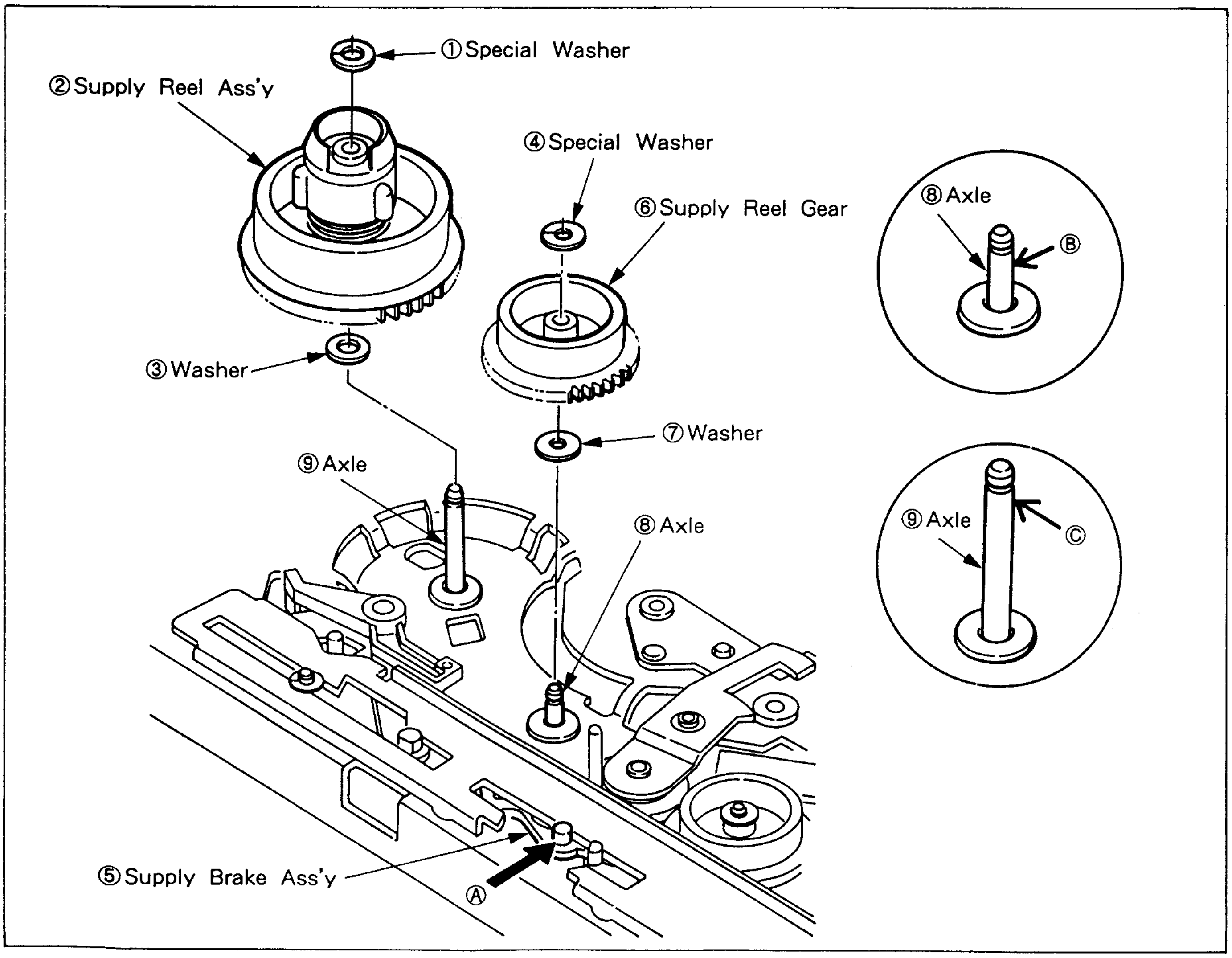


Fig. 5-8-1. Supply Reel Ass'y & Supply Reel Gear

5-8-2. Take-up Reel Ass'y (See Fig. 5-8-2.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the special washer ①.
3) Push the SUB TAKE-UP BRAKE ASS'Y ② in the direction of arrow A to release the brake, then remove the TAKE-UP REEL ASS'Y ③ and the washer ④.

Note : Be sure that no dirt gets on the section where both brake shoes make contact.

2. Remounting

1) Apply 1 drop of oil to the part of the axle ⑤ indicated by the arrow B, then mount the washer ④.
2) While pushing the SUB TAKE-UP BRAKE ASS'Y ② in the direction of arrow A, mount the TAKE-UP REEL ASS'Y ③ onto the axle ⑤.
3) Perform reel table height adjustment as instructed in 6-2.
4) Mount the special washer ① onto the axle ⑤.
5) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.

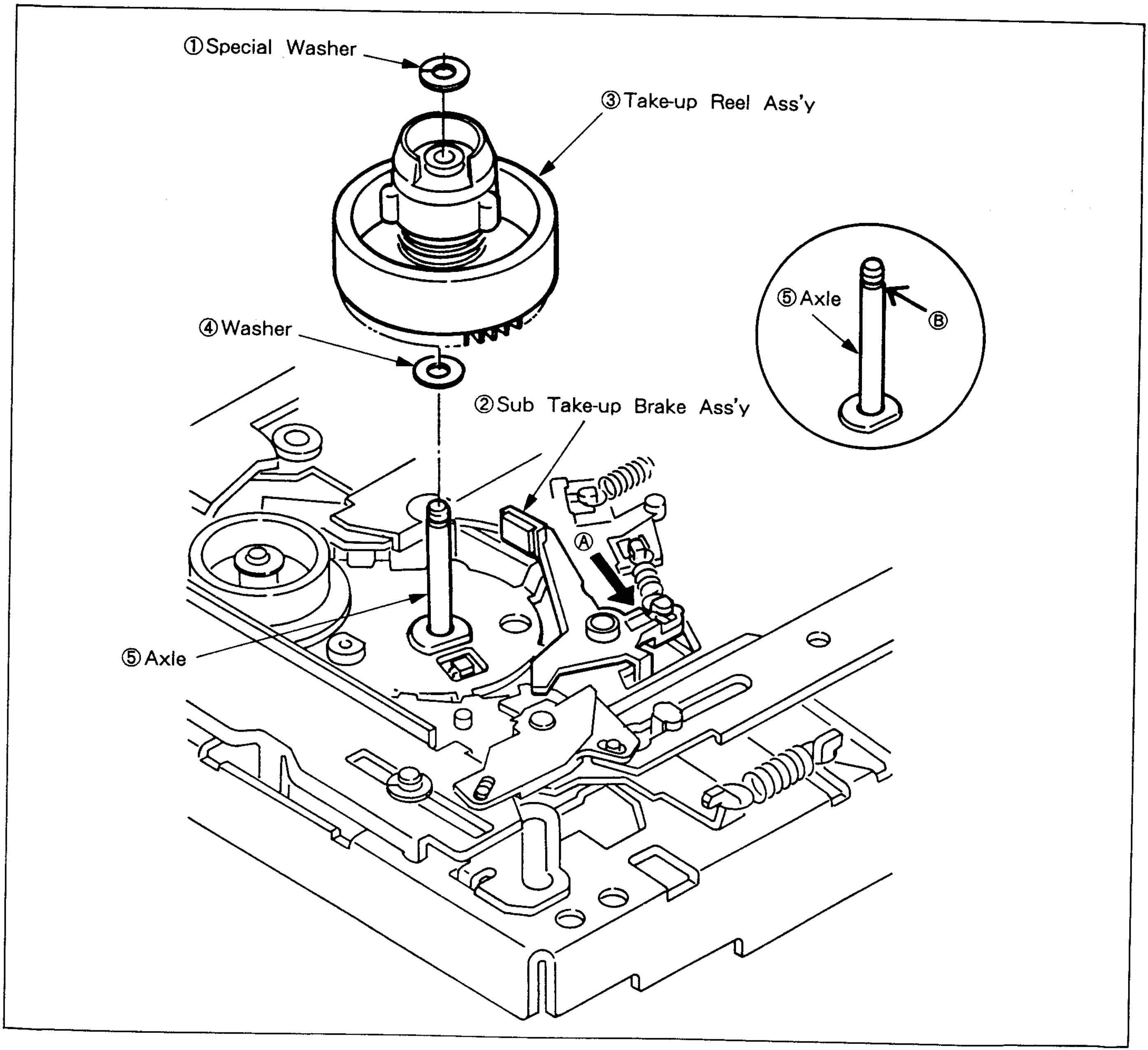


Fig. 5-8-2. Take-up Reel Ass'y

5-8-3. Take-up Reel Gear (See Fig. 5-8-3.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the TAKE-UP REEL ASS'Y as instructed in 5-8-2.
3) Remove the SUB TAKE-UP BRAKE ASS'Y as instructed in 5-7-1.
4) Remove the TAKE-UP BRAKE ASS'Y as instructed in 5-7-2.
5) Remove the special washer ①, then remove the TAKE-UP REEL GEAR ③ and the washer ④.

2. Remounting

1) Apply a little oil (less than one drop) to the part of the axle ⑤ indicated with an arrow.
2) Mount the washer ④ and the TAKE-UP REEL GEAR ③ onto the axle ⑤.
3) Mount the special washer ① onto the axle ⑤.
4) Mount the TAKE-UP BRAKE ASS'Y as instructed in 5-7-2.
5) Mount the SUB TAKE-UP BRAKE ASS'Y as instructed in 5-7-1.
6) Mount the TAKE-UP REEL ASS'Y as instructed in 5-8-2.
7) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.

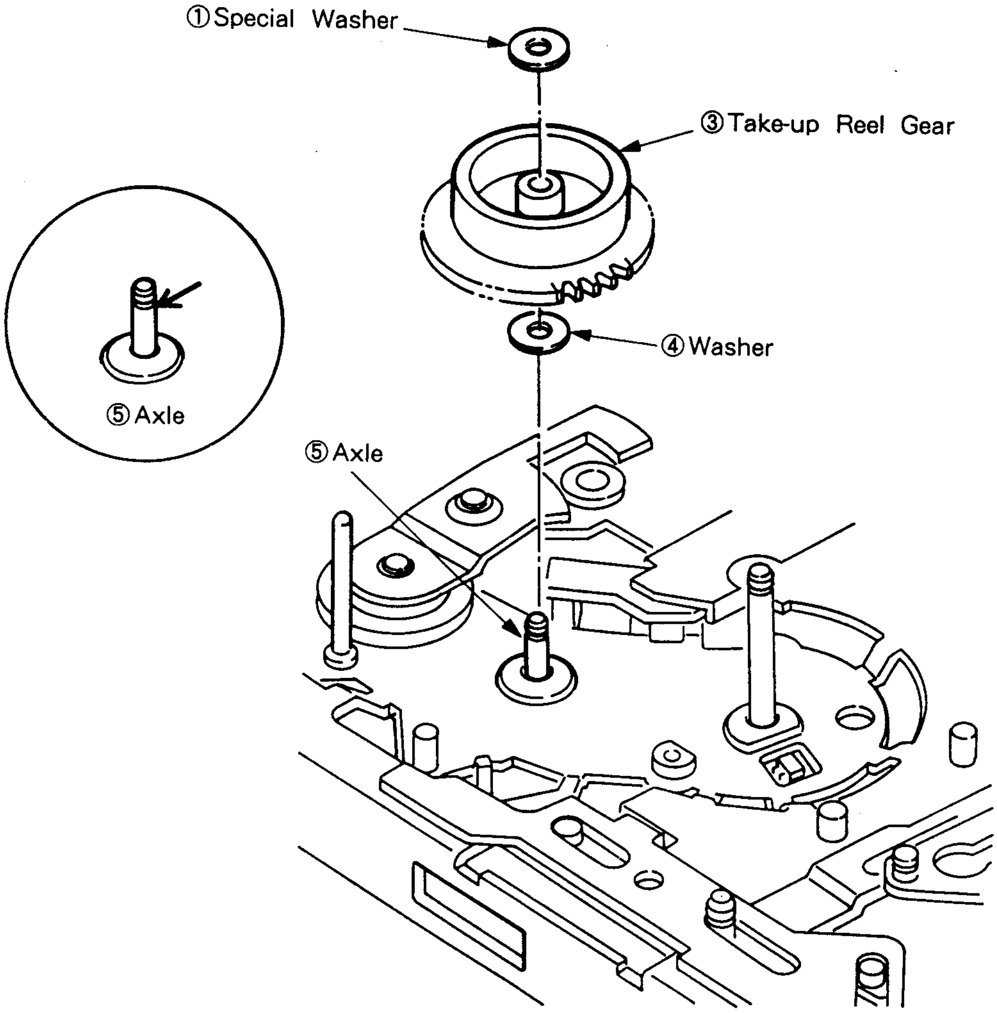


Fig. 5-8-3. TaKe-up Reel Gear

5-8-4. Reel Pulley and Friction Gear Ass'y (See Fig. 5-8-4.)

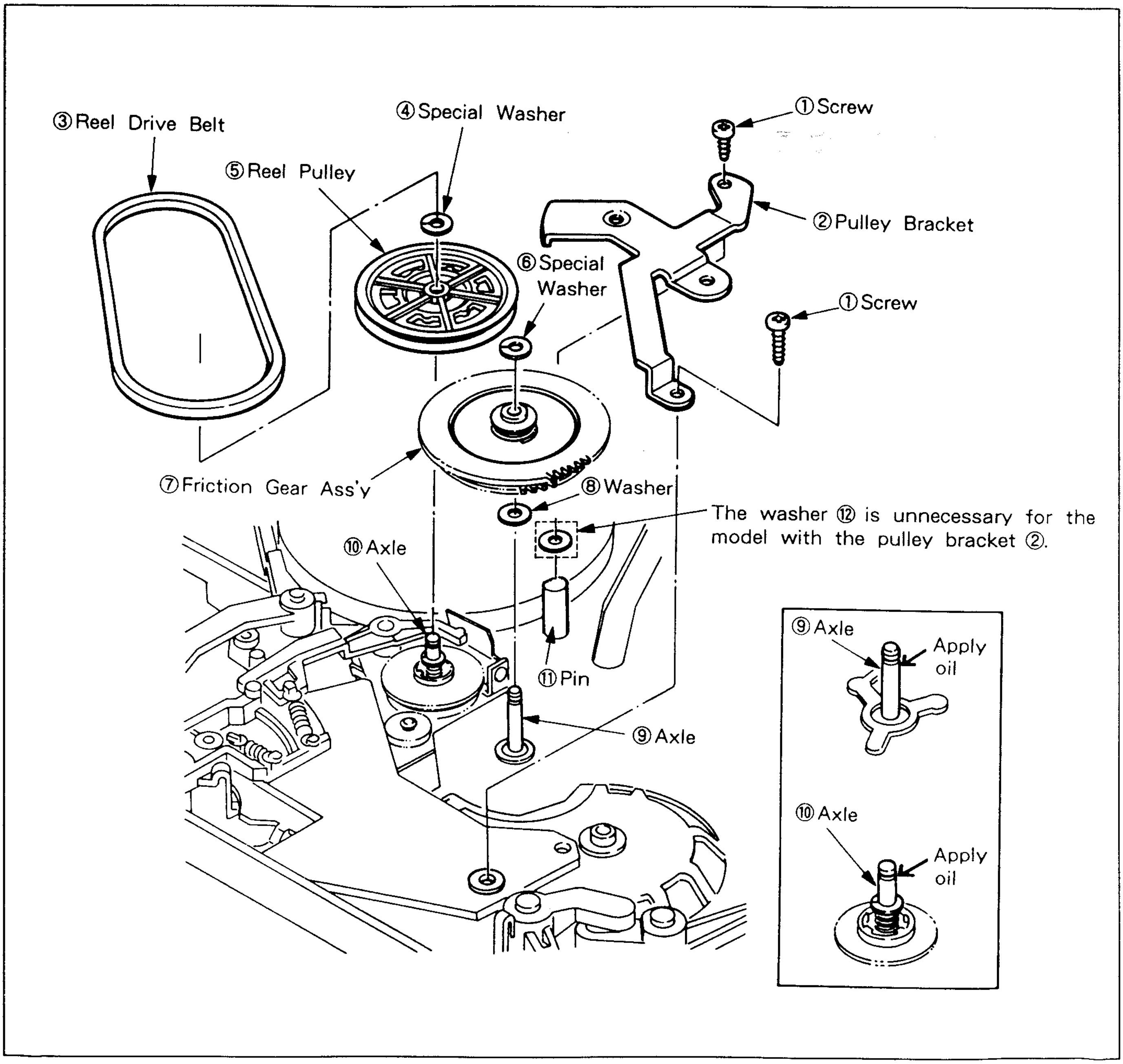
1. Removal

1) Remove the two screws ①, then remove the PULLEY BRACKET ②.
2) Remove the REEL DRIVE BELT ③.
3) Remove the special washer ④, then remove the REEL PULLEY ⑤.
4) Remove the special washer ⑥, then remove the FRICTION GEAR ASS'Y ⑦ and the washer ⑧.

Note : Some model are not mounted the pulley bracket ②. The washer ⑫ is mounted on the pin ⑪ with a screw ①, and serves as the PULLEY BRACKET ②.

2. Remounting

1) Apply one drop of oil to the parts of axles ⑨ and ⑩ indicated with an arrow.
2) Mount the washer ⑧ and the FRICTION GEAR ASS'Y ⑦ onto the axle ⑨.
3) Mount the special washer ⑥ onto the axle ⑨.
4) Mount the REEL PULLEY ⑤ onto the axle ⑩.
5) Mount the special washer ④ onto the axle ⑩.
6) Set the REEL DRIVE BELT ③.
7) Mount the PULLEY BRACKET ② with the two screws ①.


③Reel Drive Belt
④Special Washer
①Screw
⑤Reel Pulley
②Pulley Bracket
⑥Special Washer
①Screw
⑦Friction Gear Ass'y
⑧Washer
⑩Axle
⑪Pin
⑨Axle
⑨Axle
Apply oil
⑩Axle
Apply oil

The washer ⑫ is unnecessary for the model with the pulley bracket ②.

Fig. 2-8-4. Reel Pulley & Friction Gear

5-8-5. COMPL Clutch (See Fig. 5-8-5.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the PULLEY BRACKET, the REEL DRIVE BELT and the REEL PULLEY as instructed in 5-8-4.
3) Remove the screw ①, then remove the COMPL MC-4 ②.
4) Remove the two screws ③, then remove the COMPL CLUTCH ④.

2. Remounting

1) Mount the COMPL CLUTCH ④ with the two screws ③, aligning it with the protuberance ⑤.
2) After inserting the CN831 (COMPL MC-4) into the CN801 (COMPL MC-1), mount the COMPL MC-4 with the screw ①.
3) Mount the REEL PULLEY, the REEL DRIVE BELT and the PULLEY BRACKET as instructed in 5-8-4.
4) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.

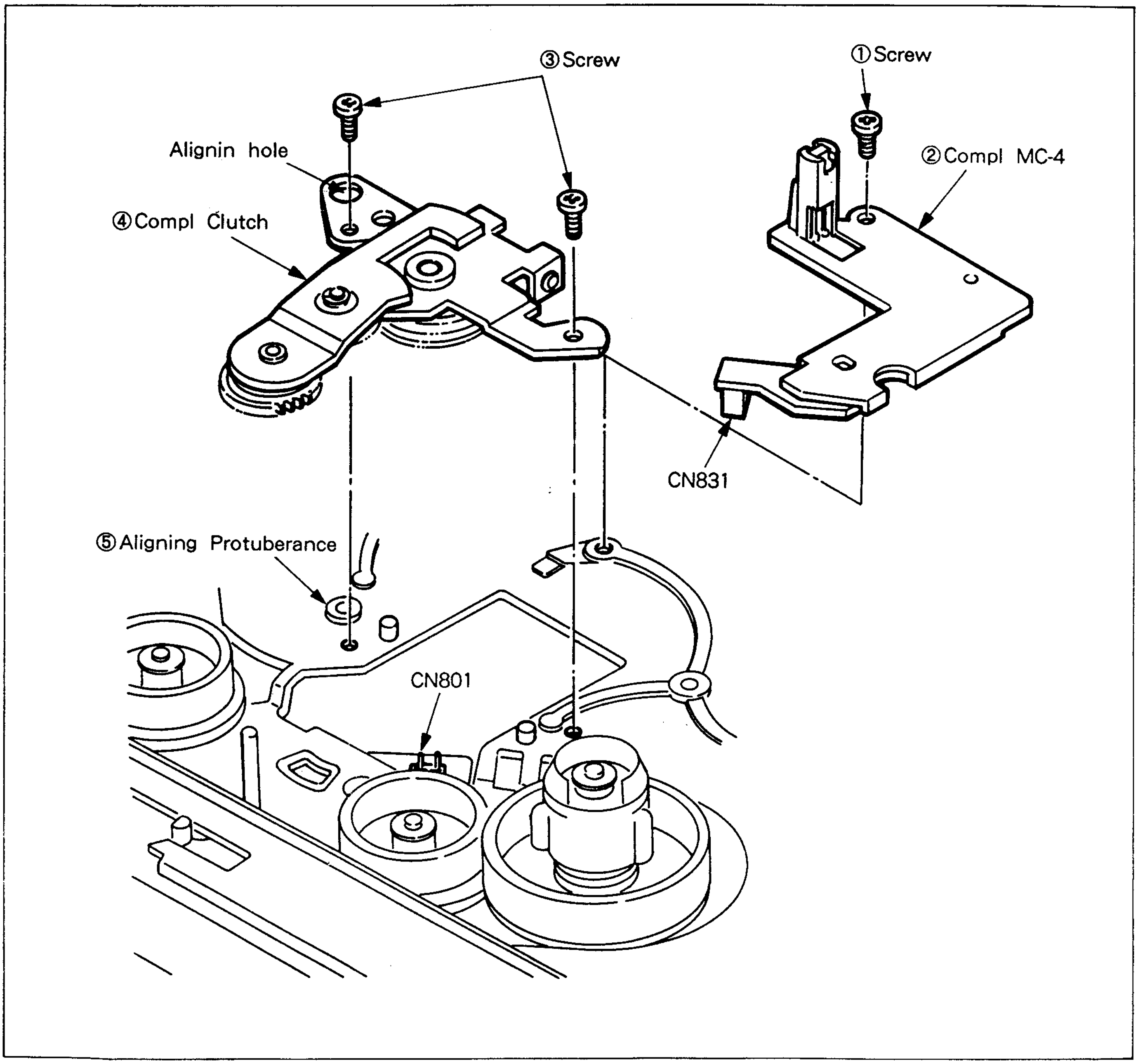

③Screw
①Screw
Alignin hole
②Compl MC-4
④Compl Clutch
CN831
⑤Aligning Protuberance
CN801

Fig. 5-8-5. Compl Clutch

5-8-6. Clutch Change Lever and Clutch Lever Ass'y (See Fig. 5-8-6.)

1. Removal

1) Remove the CAPSTAN BRAKE ASS'Y as instructed in 5-7-4.
2) Remove the PULLEY BRACKET, the REEL DRIVE BELT and the REEL PULLEY as instructed in 5-8-4.
3) Remove the SPRING COIL ①.
4) Unhook the hook ②, then remove the CLUTCH CHANGE LEVER ③.
5) Unhook the hook ⑤, then remove the CLUTCH LEVER ASS'Y ⑥.

2. Remounting

1) Mount the CLUTCH LEVER ASS'Y ⑥ onto the axle ⑦. Confirm that the hook ⑤ is hooked to the chassis.
2) Mount the CLUTCH CHANGE LEVER ③ onto the axle ⑧. Confirm that the hook ② is hooked to the chassis.
3) Hook the SPRING COIL ① between the hooks ⑨ and ⑩.
4) Mount the PULLEY BRACKET, the REEL DRIVE BELT and the REEL PULLEY as instructed in 5-8-4.
5) Mount the CAPSTAN BRAKE ASS'Y as instructed in 5-7-4.

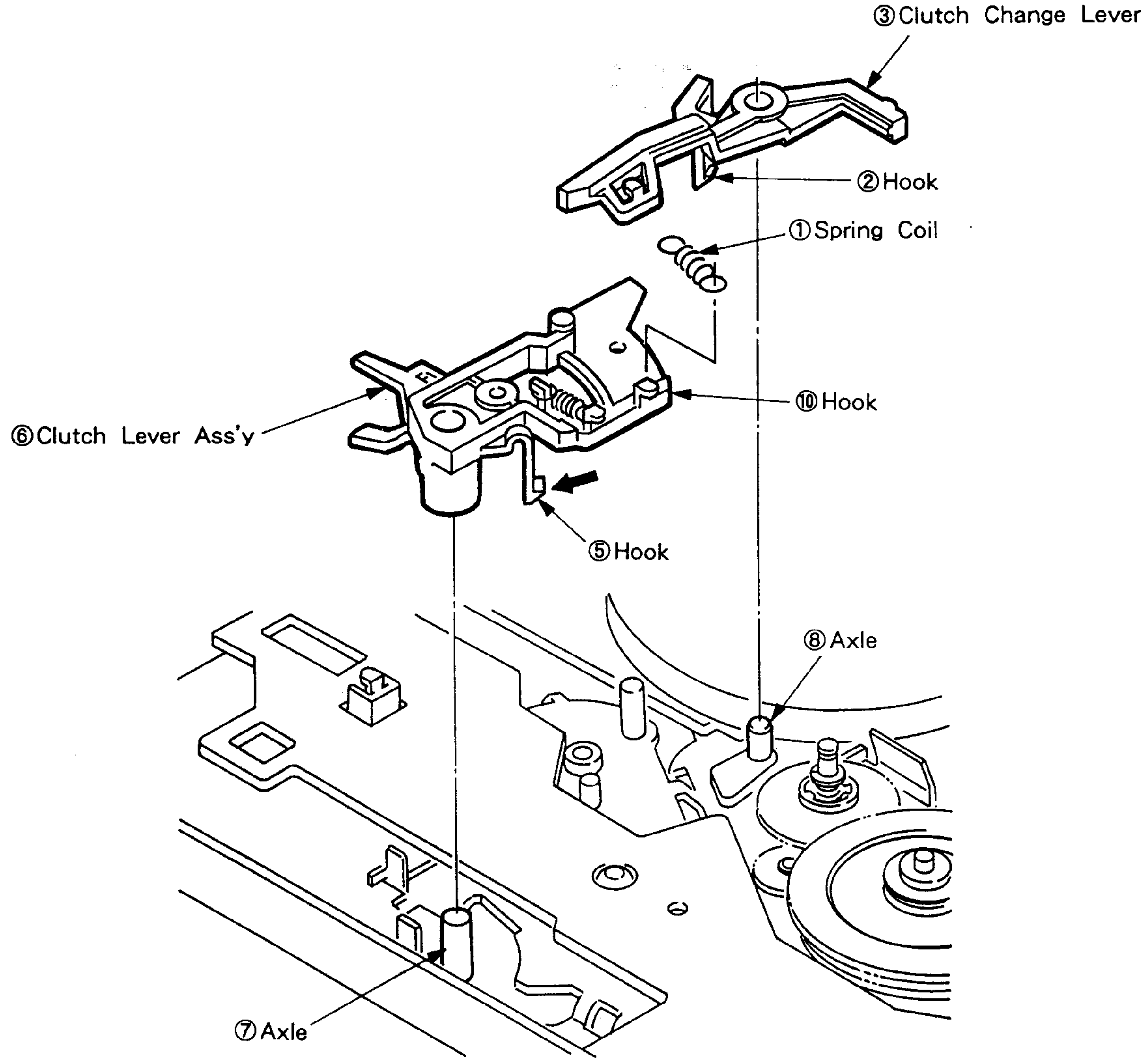


Fig. 5-8-6. Clutch Change Lever & Clutch Lever Ass'y

5-9. CAPSTAN MOTOR (See Fig. 5-9-1.)

1. Removal

1) Remove the CAPSTAN BRAKE ASS'Y as instructed in 5-7-4.
2) Remove the CAPSTAN MOTOR ⑥ connector.
3) Remove the REEL DRIVE BELT ② from the CAPSTAN MOTOR PULLEY ①.
4) Remove the two screws ④ fixing the COMPL CASSETTE MECHANISM TOP BOARD ③, then slide the TOP BOARD ③ backward.
5) Remove the three screws ⑤, then remove the CAPSTAN MOTOR ⑥.

Note : Take care not to scratch or soil the capstan axle.

2. Remounting

1) Mount the CAPSTAN MOTOR ⑥ with the three screws ⑤.
2) Connect the CAPSTAN MOTOR ⑥ connector.
3) Mount the TOP BOARD ③ with the two screws ④.
4) Fit the REEL DRIVE BELT ② around the CAPSTAN MOTOR PULLEY ① and the REEL PULLEY ⑦.
5) Mount the CAPSTAN BRAKE ASS'Y as instructed in 5-7-4.

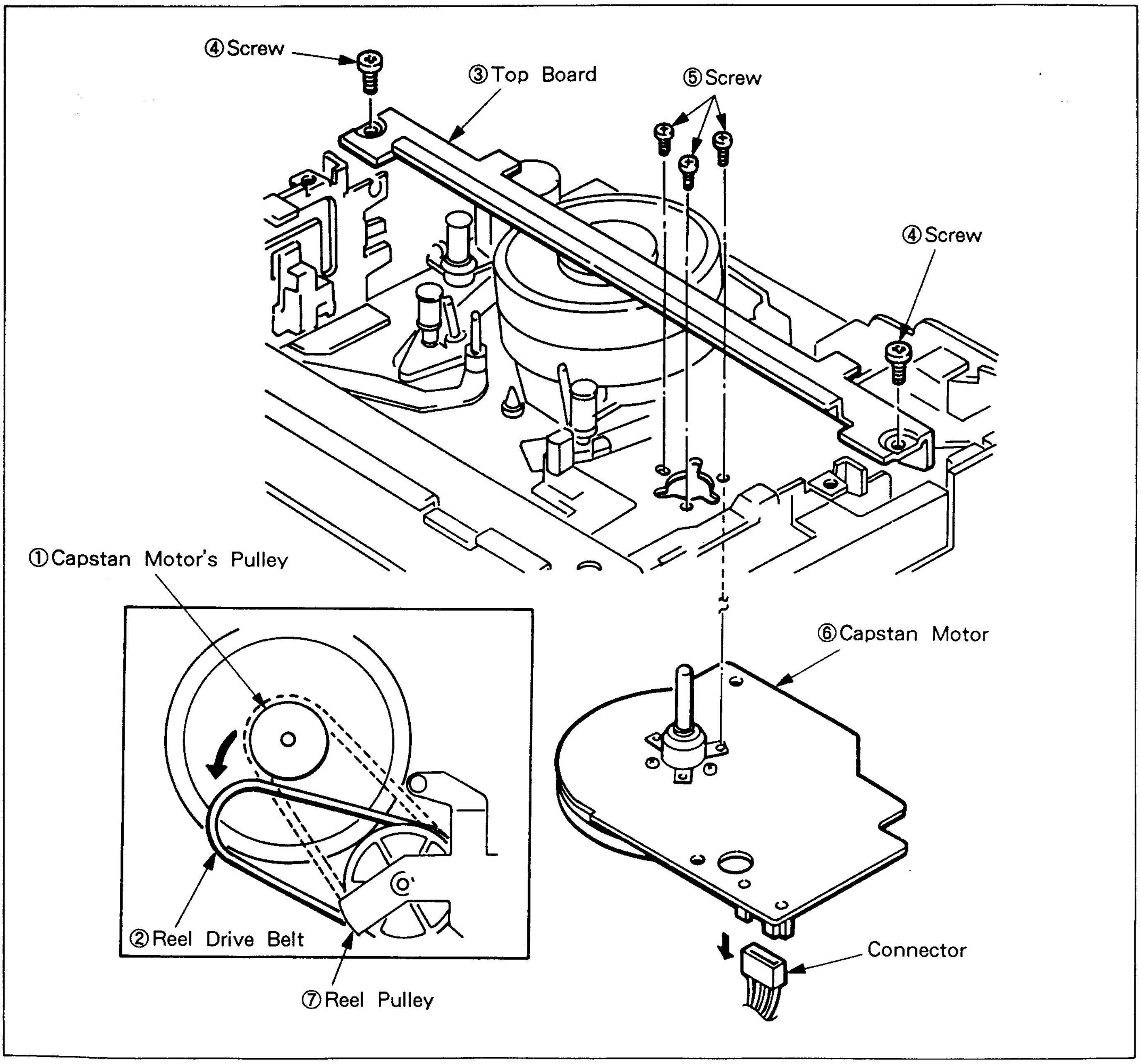

④Screw
③Top Board
⑤Screw
④Screw
①Capstan Motor's Pulley
⑥Capstan Motor
②Reel Drive Belt
Connector
⑦Reel Pulley

Fig. 5-9-1. Capstan Motor

5-10. FIXED GUIDE, FE HEAD LEVER ASS'Y

5-10-1. Entrance side Fixed Guide and FE Lever Ass'y (See Fig. 5-10-1.)

1. Removal

1) Remove the SP NUT ①, then remove the GUIDE PIPE ③ and the SP washer ② (lower), in that order.
2) Remove the SPRING COIL ⑤.
3) Remove the FTE HEAD connector.
4) Remove the special washer ⑥, then remove the FE HEAD LEVER ASS'Y ⑦.

Note : A SP washer ⑪ (upper) and a SPRING COIL ④ are sometimes inserted between the SP NUT ①and the special washer ⑥. In this case, put it back in its original position when remouting the entrance side fixed guide.

2. Remounting

1) After mounting the FE LEVER ASS'Y ⑦ onto the axle ⑧, mount the special washer ⑥.
2) Hook the SPRING COIL ⑤ between the chassis notch ⑨ and the FE LEVER ASS'Y hook ⑩.
3) Mount the SP washer ② (lower), the GUIDE pipe ③ and the SP NUT ① to the axle ⑧, in that order.

   (At that time, do not excessively tighten the SP NUT ① to avoid idle rotation of the axle rivet. The height of fixing guide on the entrance side is not required.)
4) Connect the connector to the FTE HEAD.
5) Perform hight adjustment of the entrance side fixed guide (S) as instructed in 6-4 when remounted the SPRING COIL ④ and the SP washer ⑪ (upper).

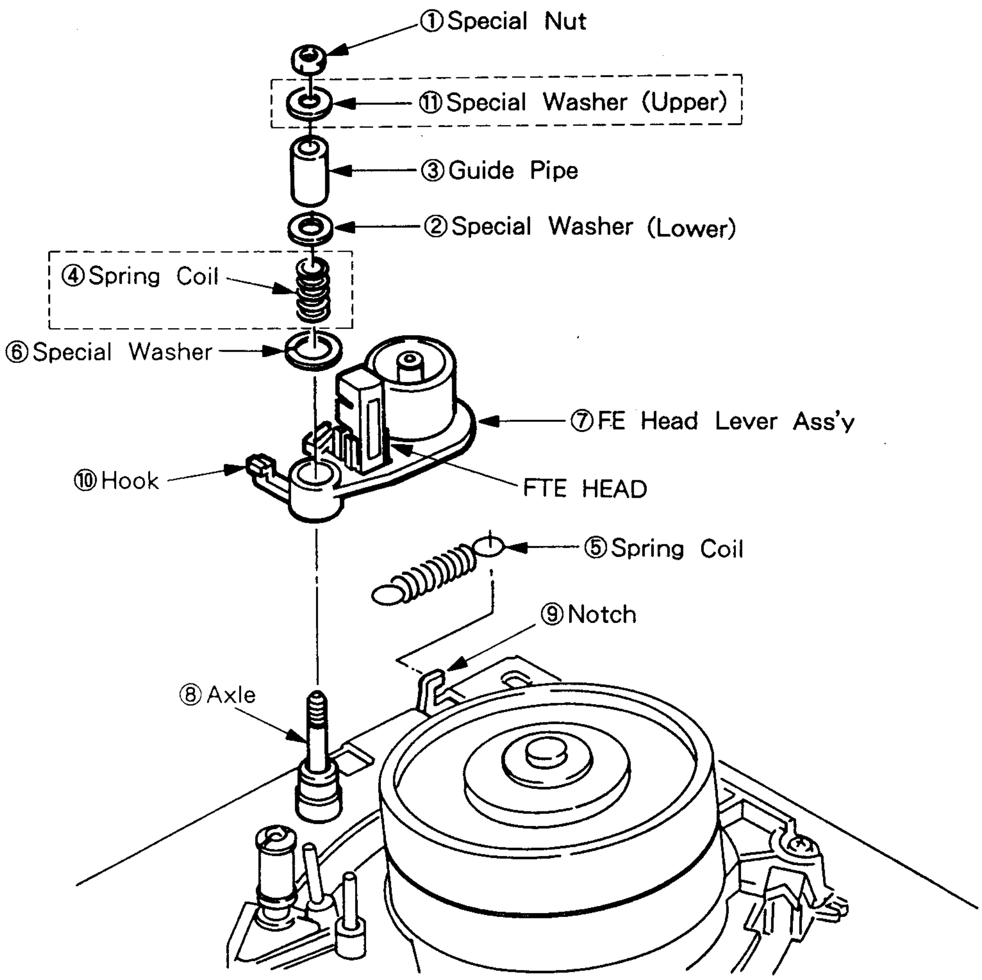

①Special Nut
⑪Special Washer (Upper)
③Guide Pipe
②Special Washer (Lower)
④Spring Coil
⑥Special Washer
⑦FE Head Lever Ass'y
⑩Hook
FTE HEAD
⑤Spring Coil
⑨Notch
⑧Axle

Fig. 5-10-1. Fixed Guide (S) & FE Lever Ass'y

5-10-2. Impedance Roller, FTE Head (See Fig. 5-10-2.)

1. Removal

1) Remove the FTE HEAD (full track erase head) ① connector.
2) Remove the special washer ②, then remove the IMPEDANCE ROLLER ③ and the washer ④.
3) Open the hook ⑤ a little and remove the FTE HEAD ①.

Note : Take care not to open the hook too much, otherwise it may be deformed or broken.

2. Remounting

1) Mount the FTE HEAD ① onto the FE HEAD LEVER ASS'Y ⑥. Confirm that the hook ⑤ is hooked to the FTE HEAD ①.
2) Mount the washer ④ and the IMPEDANCE ROLLER ③, in that order, onto the axle ⑦, then mount the special washer ②.
3) Connect the connector to the terminal of the FTE HEAD ①.

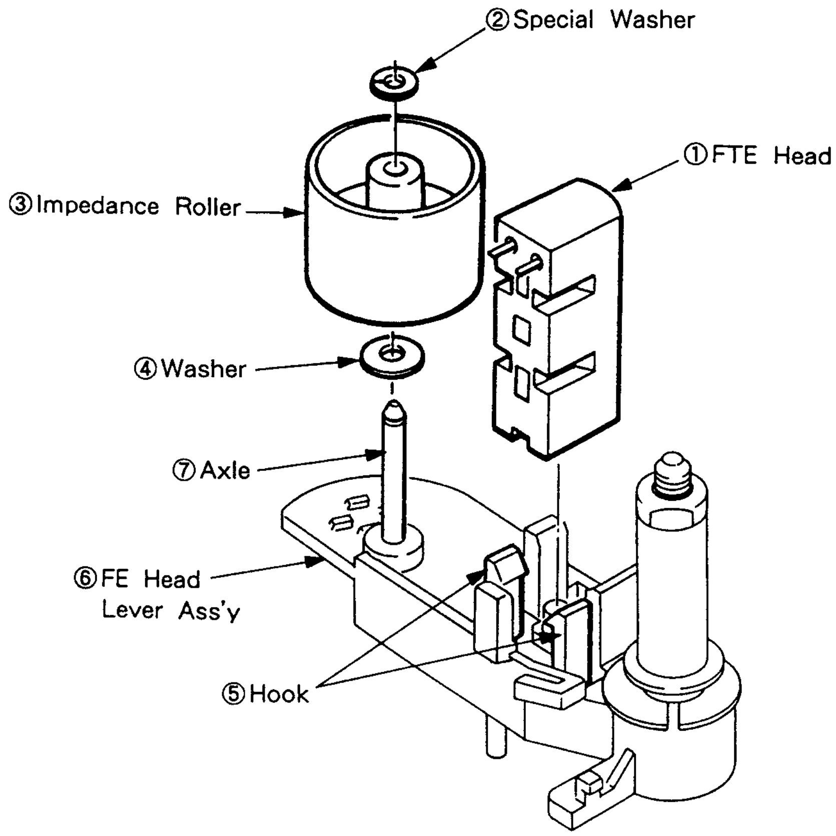

②Special Washer
①FTE Head
③Impedance Roller
④Washer
⑦Axle
⑥FE Head Lever Ass'y
⑤Hook

Fig. 5-10-2. Impedance Roller & FTE Head

5-10-3. Exit side Fixed Guide (See Fig. 5-10-3.)

1. Removal

1) Remove the CAP ①.
2) Remove the SP NUT ②, then remove the SP washer ③ (upper), the GUIDE PIPE ④, the SP washer ③ (lower) and the SPRING COIL ⑤, in that order.

2. Remounting

1) Mount the SPRING COIL ⑤, the SP washer ③ (lower), the GUIDE PIPE ④, the SP washer ③ (upper) and the SP NUT ②, in that order, to the axle ⑥.
2) Mount the CAP ① onto the axle ⑥.
3) Perform height adjustment of the fixed guide (T) as instructed in 6-4.

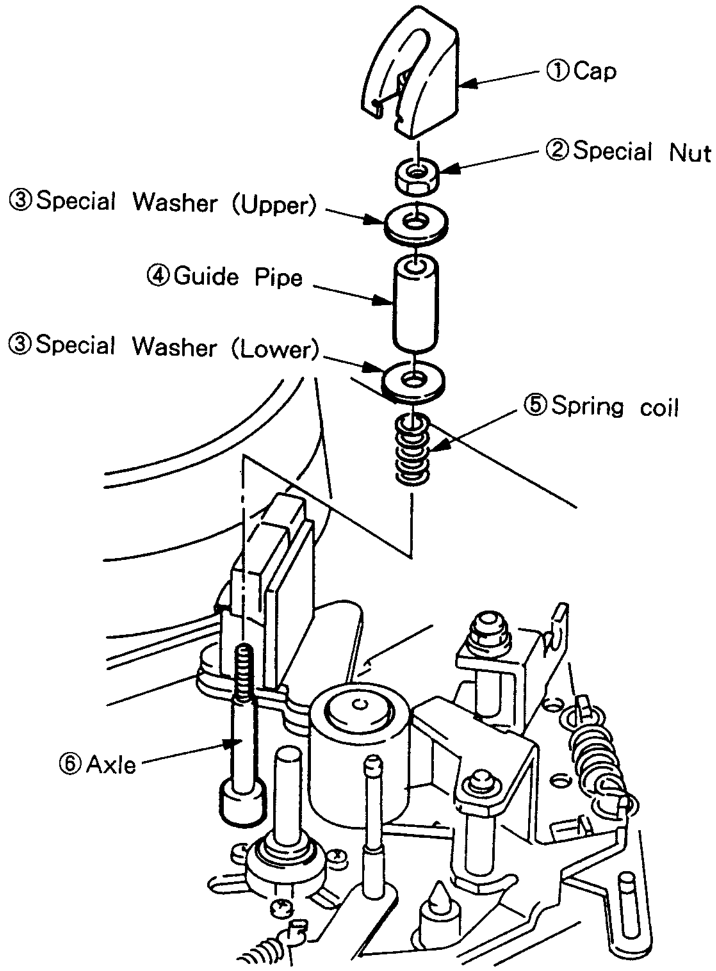

①Cap
②Special Nut
③Special Washer (Upper)
④Guide Pipe
③Special Washer (Lower)
⑤Spring coil
⑥Axle

Fig. 5-10-3. Fixed Guide (T)

5-11. DRUM SECTION

5-11-1. Drum Motor (rotor, stator) (See Fig. 5-11-1.)

1. Removal

1) Remove the screw ①, then remove the CYLINDER EARTH ASS'Y ②.
2) Remove the two screws ③, then remove the ROTOR ④ and SPACER.
3) Remove the STATOR board connector ⑩.
4) Remove the three screws ⑤, then remove the STATOR ⑥.

2. Remounting

1) Mount the STATOR ⑥ with the three screws ⑤.
2) Mount the SPACER ⑪ on to the AXLE ⑫.
3) While aligning the ROTOR oval hole ⑦ with the ROTOR DISK hole ⑧, mount the ROTOR with the two screws ③.
4) Insert the connector ⑩.
5) While aligning the CYLINDER EARTH ASS'Y ② protuberance with the chassis hole ⑨, mount it with the screw ①.

Note 1 : Use a torque driver (VHJ-0014) for mounting the STATOR ⑥ and the ROTOR ④. Set fastening torque to 3kg-cm.

Note 2 : When the drum unit has been replaced, perform a tape path adjustment as instructed in 6-4. and perform a CH-1/CH-2 switching position adjustment of the servo circuit.

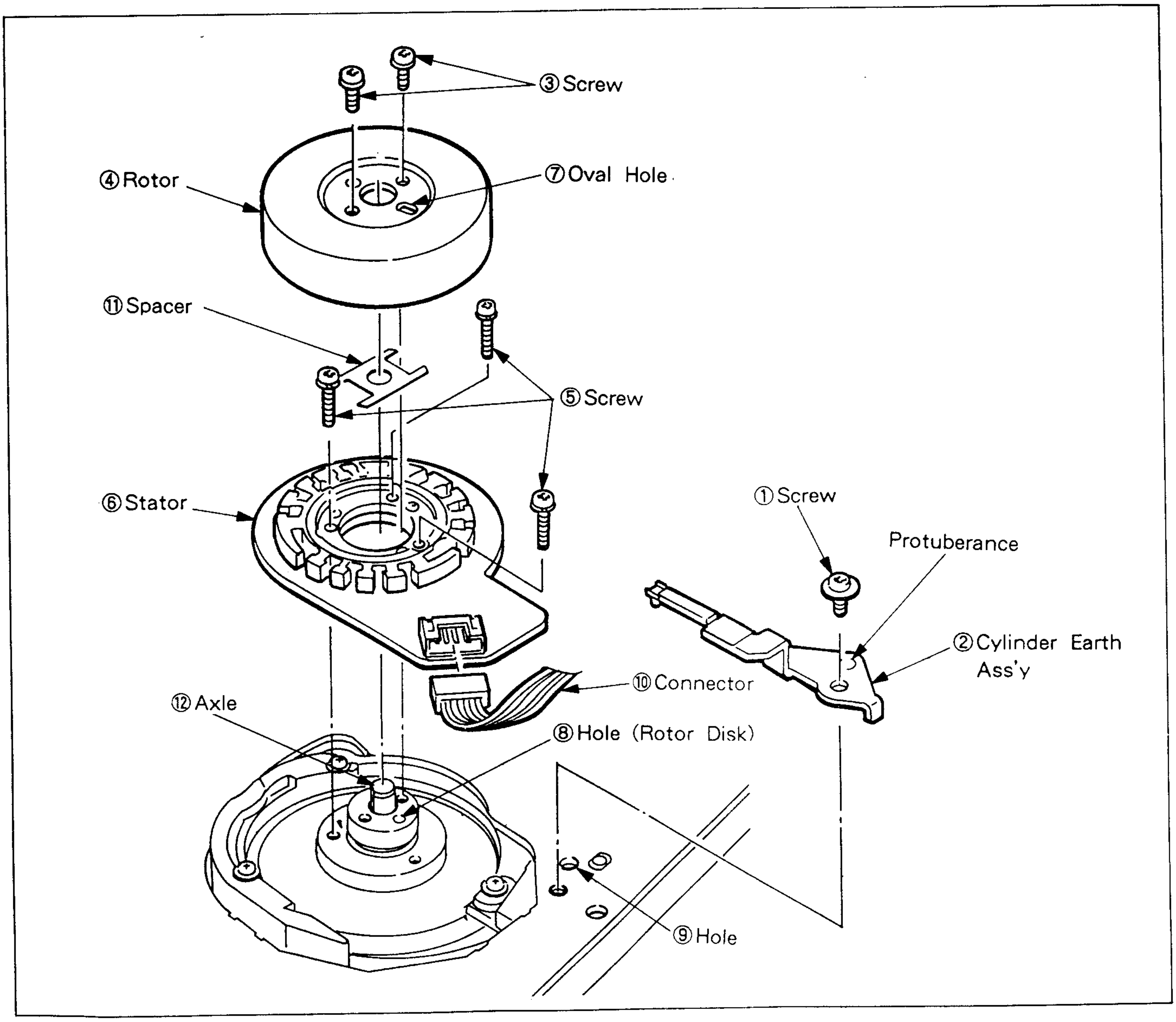

③Screw
④Rotor
⑦Oval Hole
⑪Spacer
⑤Screw
⑥Stator
①Screw
Protuberance
②Cylinder Earth Ass'y
⑩Connector
⑫Axle
⑧Hole (Rotor Disk)
⑨Hole

Fig. 5-11-1. Drum Motor

5-11-2. Drum Unit (See Fig. 5-11-2.)

1. Removal

1) For some models with the board located above the upper drum, remove the board.
2) Remove the flexible cable ① from the PRE-AMP UNIT (take care not to pull the flexible cable in the upward direction).
3) Remove the LOAD RACK only, as instructed in 5-4-1.
4) Remove the three screws ②, then remove the drum unit ③.

NOTE : When removing and remounting the drum unit, handle it carefully to protect it from scratches and dirt.

2. Remounting

1) While aligning the drum unit ③ to the protuberance, mount it to the drum base (CYLINDER BASE) ⑤ with the three screws ②.
2) Mount the ROAD RACK as instructed in 5-4-1.
3) Insert the flexible cable into the PRE-AMP UNIT.
4) Clean the drum unit.
5) Perform the tape path adjustment as instructed in 6-4. and perform the CH-1/CH-2 switching position adjustment of the servo circuit.

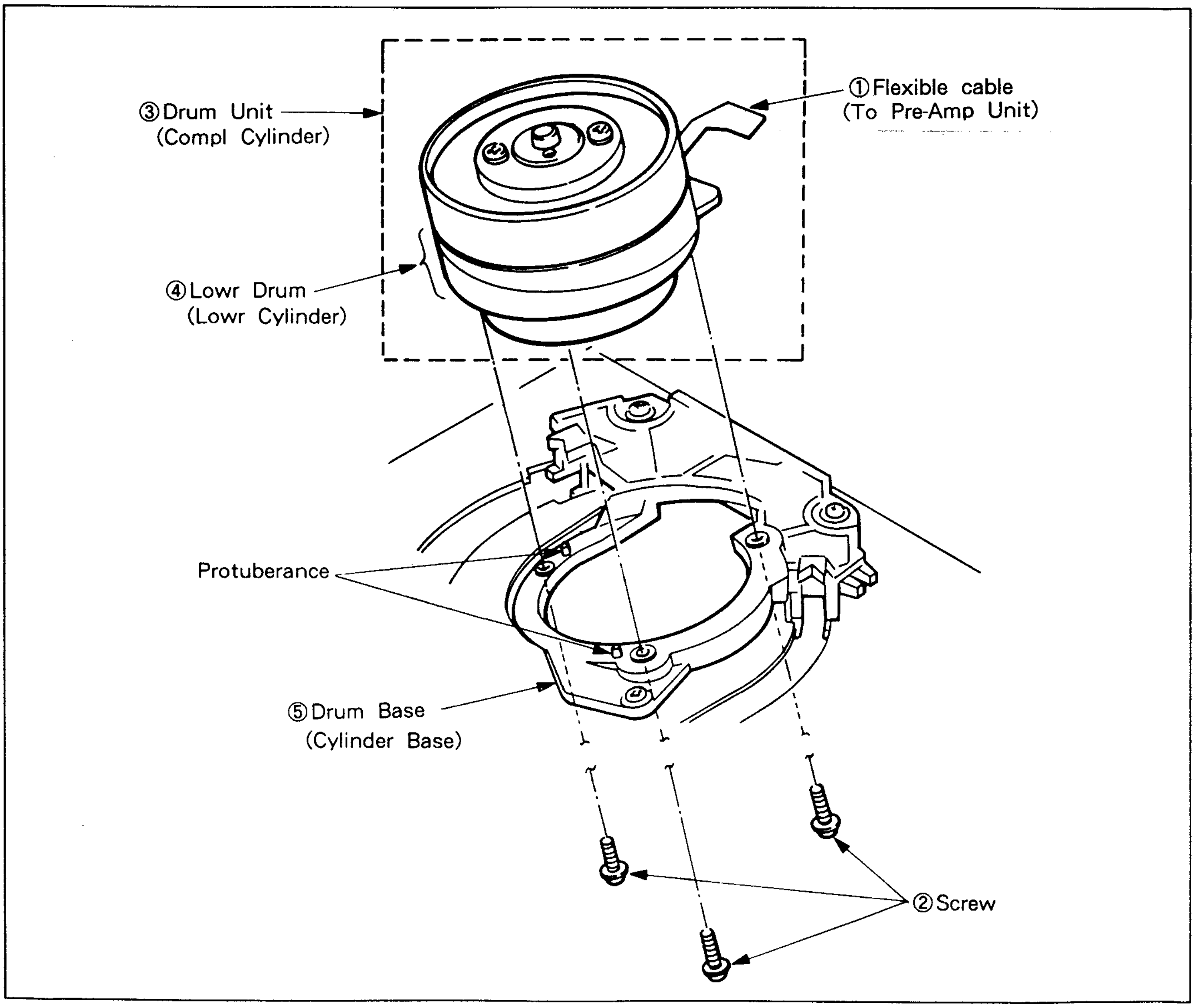

③Drum Unit
(Compl Cylinder)
①Flexible cable
(To Pre-Amp Unit)
④Lowr Drum
(Lowr Cylinder)
Protuberance
⑤Drum Base
(Cylinder Base)
②Screw

Fig. 5-11-2 Drum Unit (Compl Cylinder)

5-11-3. Upper Drum (Upper Cylinder)

1. Removal

1) Remove the two screws ① (see Fig. 5-11-3).
2) In case the RE (ROTARY ERASE) HEAD is attached to the upper drum (UPPER CYLINDER), remove the lead wires soldered from the P.C. board (see Fig. 5-11-4.).
3) Turn the head removing jig (VHJ-0041) handle ② counterclockwise to lift up the stopper ③ (see Fig. 5-11-5.).
4) Insert the two long screws ④ of the jig into the screw holes ⑥ located on the head chip side of the upper drum (UPPER CYLINDER) ⑤, then mount by turning the handle clockwise.
5) While holding the jig so that the upper drum ⑤ does not rotate, turn the handle ② clockwise to remove the upper drum.
6) Remove the jig from the upper drum.

Note : Handle parts carefully to protect the drum from scratches and dirt, and the video head from damage.

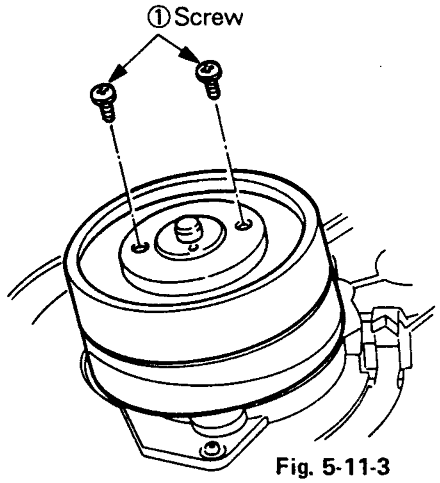


Fig. 5-11-3

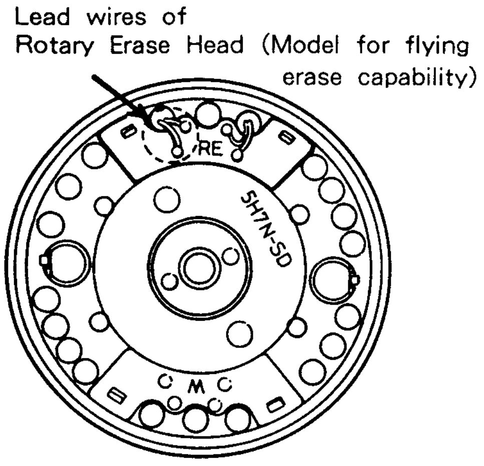

Lead wires of
Rotary Erase Head (Model for flying erase capability)
RE
5H7N-SD
C M C

Fig. 5-11-4

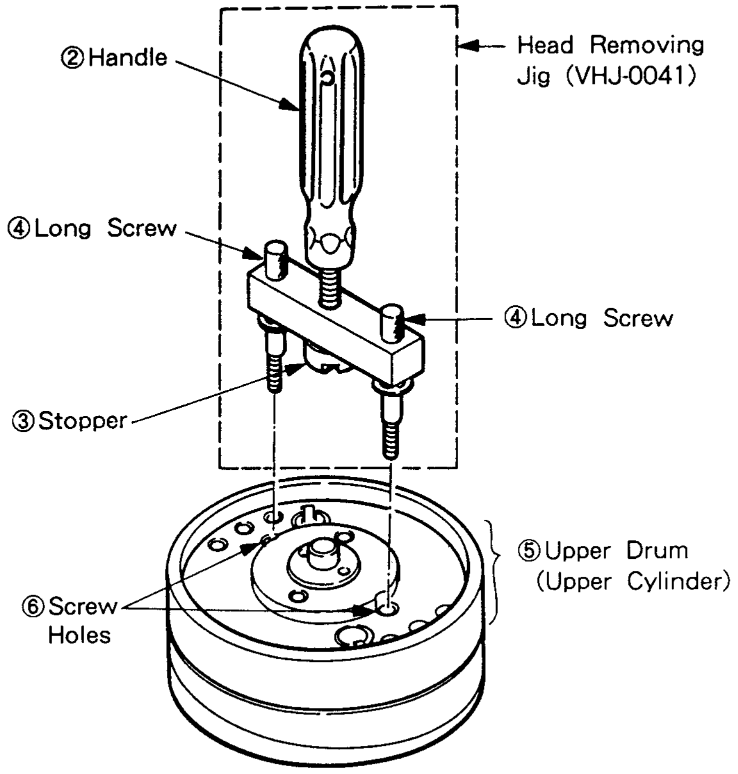

②Handle
Head Removing Jig (VHJ-0041)
④Long Screw
④Long Screw
③Stopper
⑤Upper Drum (Upper Cylinder)
⑥Screw Holes

Fig. 5-11-5

Upper Drum (Upper Cylinder)

2. Remounting (See Fig. 5-11-6.)

1) Confirm that surfaces where the flywheel and the upper drum (UPPER CYLINDER) are engaged or make contact portion are free from scratches and dirt.

2) The code name ① of the drum is printed on the video head side of the upper drum ⑤ SP CH-1 (channel A, plus azimuth). The code name ① is set with in the rotary transformer terminal round hole side ② position of lower drum (LOWER CYLINDER), so that the two screw holes ③ of the upper drum are aligned with the two screw holes ④ of the flywheel. (Refer to 3. Recognizing the SP CH-1 Head side).

3) In case the RE (ROTARY ERASE) HEAD is attached to the upper drum, pass the lead wires through the lead wire hole. (See Fig.5-11-4.)

4) While keeping the upper drum ⑤ parallel to the lower drum (LOWER CYLINDER) ⑧, insert it completely into the flywheel.

5) Temporarily tighten the two screws ⑦ alternately a little at a time, then tighten them to a torque of 6kg-cm using a torque driver (VHJ-0014) and a 3mm bit (VHJ-0045).

6) In case the RE head is attached to the upper drum ⑤, solder the lead wires to the P.C. board. Solder the red lead wire to the R terminal, and the yellow lead wire to the Y terminal.

Note : When the upper drum has been replaced, perform a tape path adjustment as instructed in 6-4. and CH-1/CH-2 switching position adjustment of the servo circuit.

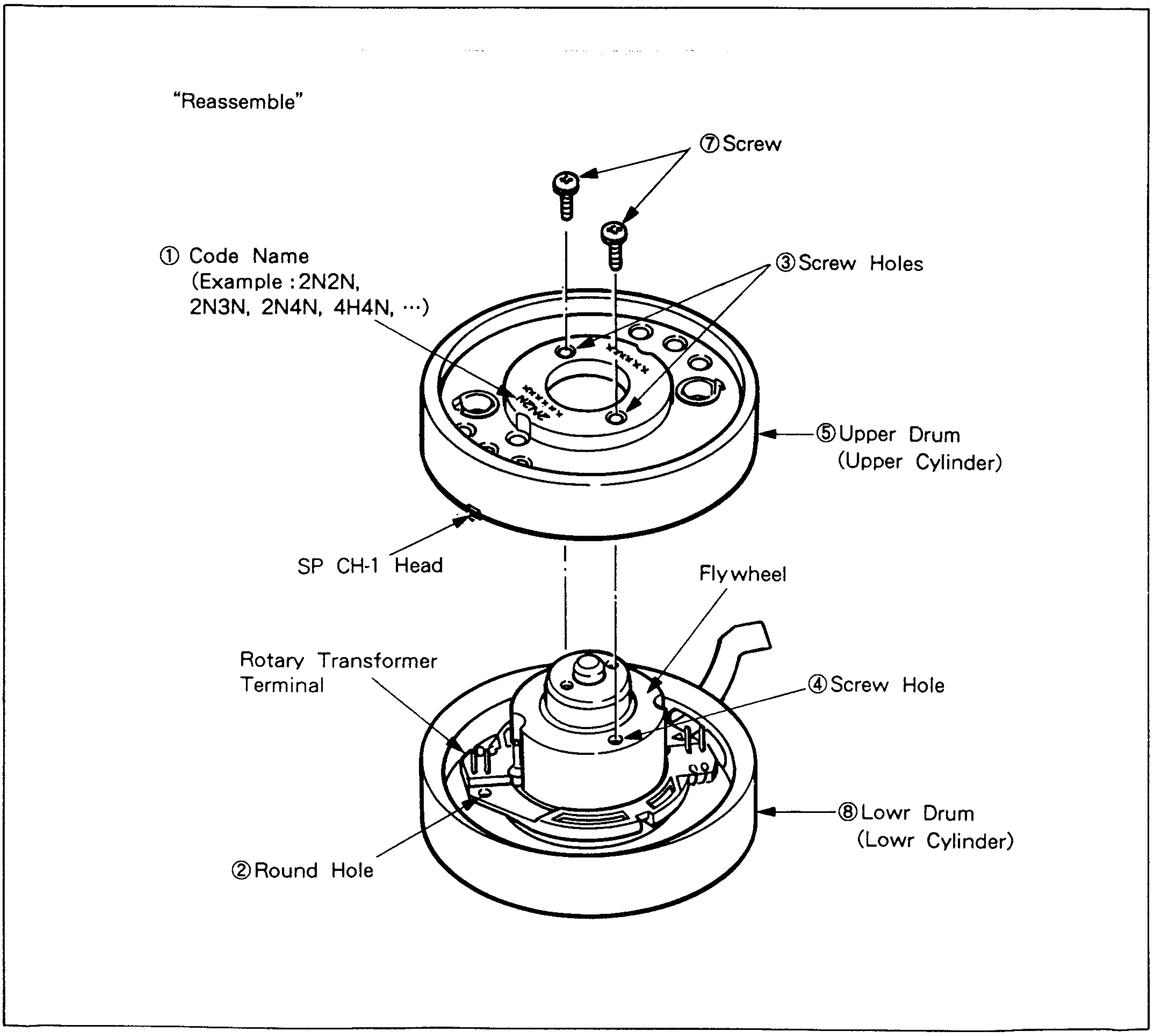
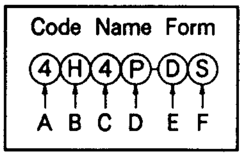

"Reassemble"
⑦Screw
① Code Name
(Example : 2N2N, 2N3N, 2N4N, 4H4N, ···)
③Screw Holes
⑤Upper Drum
(Upper Cylinder)
SP CH-1 Head
Flywheel
Rotary Transformer Terminal
④Screw Hole
⑧Lowr Drum
(Lowr Cylinder)
②Round Hole

Fig. 5-11-6.

3. **Recognizing the SP CH-1 Head Side**
No playback picture can be obtained if the video head is not wired as a pair with the rotary transformer located inside the lower drum rotating section. Therefore, mounting position should be matched when mounting the upper drum. In the P90 mechanism series, the code name of the drum is printed on the SP CH-1 (CH-A, plus azimuth) side as a mark for mounting the upper drum. (See Fig. 5-11-7.) This code name differs according to the drum type, but its basic form is as follows :


Code Name Form
④Ⓗ④ⓅⒹⓈ
A B C D E F

A = Number of head bases
B = "N" for normal audio
"H" for HI-FI audio
C = Number of heads
D = TV system ("N" or "P")
EF = Code for detailed classification. Depending on drum type, it can also be just one character, or a blank space.

Examples of Detailed Classification Codes
V = Head with level difference
D = Compatible with digital units
S = SVHS-compatible

Examples of Code Names
2N2P, 2N2P-L, 2N2P-V, 2N2P-D, 2N3P, 2N4P, 4H4P, 4H4P-D

Moreover, there is a round hole with marking purposes on the SP CH-1 (CH-A, plus azimuth) side of the lower drum rotary transformer terminal. As shown in Fig. 5-11-8, there are two types of rotary transformer terminals (the number of pins differs according to the number of heads).

Note : When ordering parts such as drums (CYLINDERS), do not use the code names ; always refer to the parts list and order with the specified part numbers.

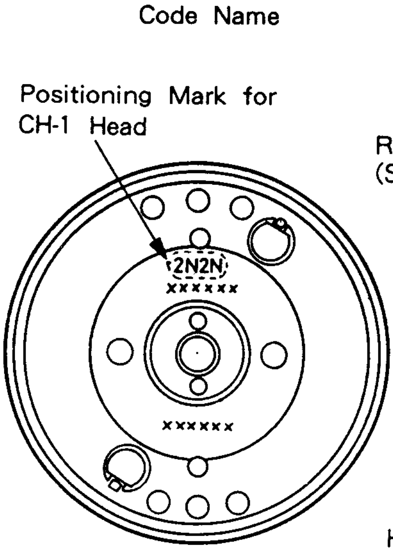

Code Name
Positioning Mark for CH-1 Head
2N2N
xxxxxx
xxxxxx

Fig. 5-11-7. Upper Drum

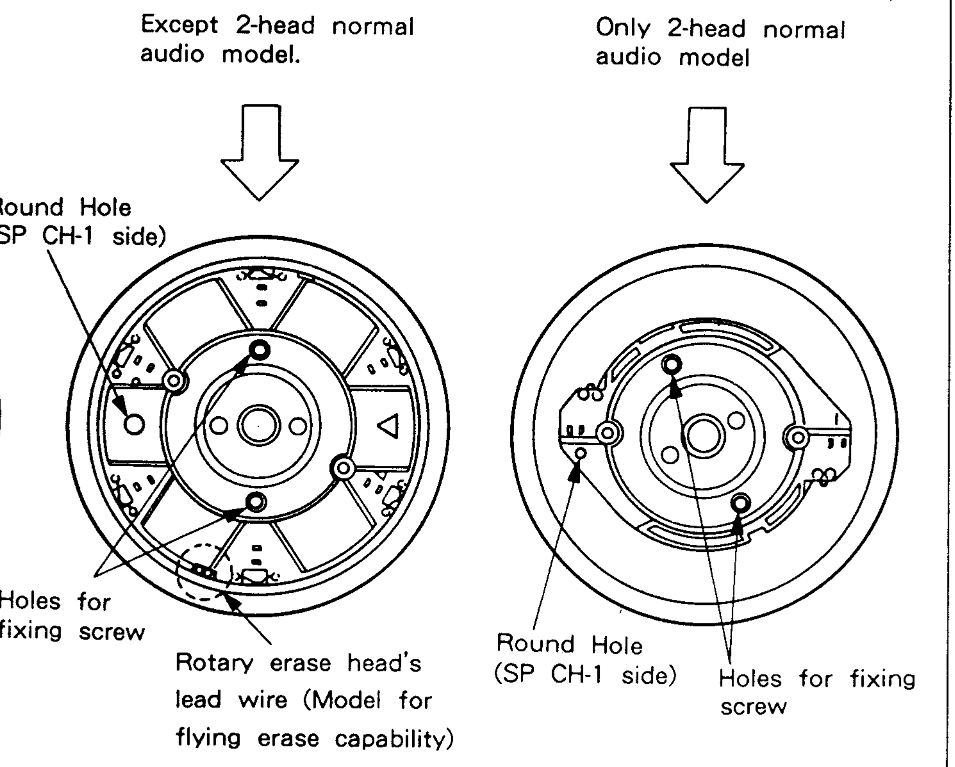
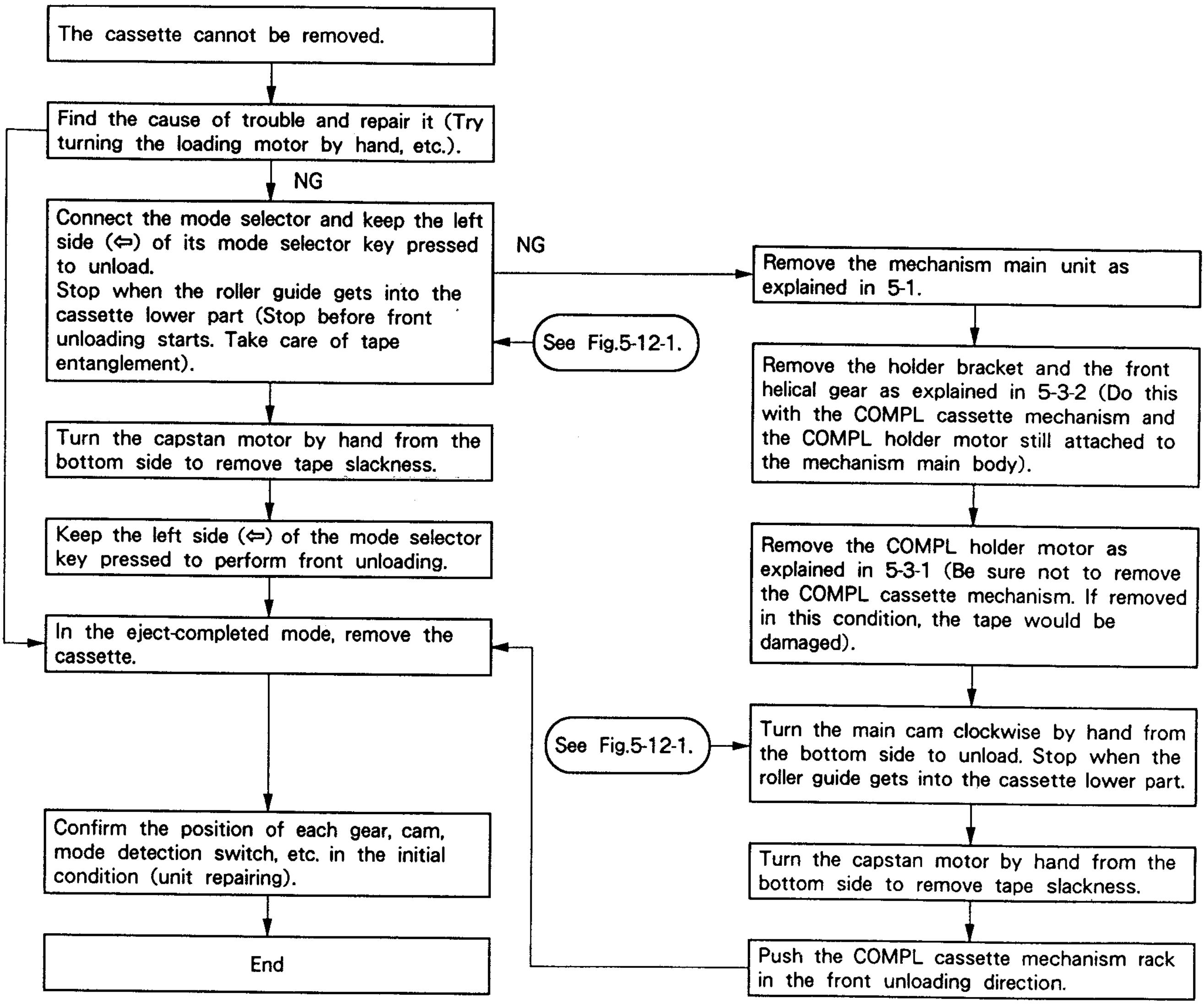
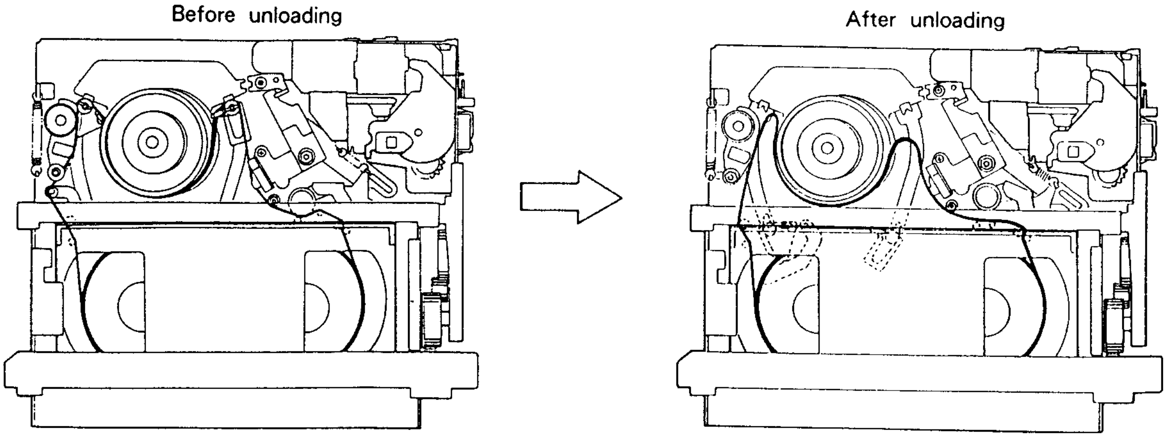

Except 2-head normal audio model.
Only 2-head normal audio model
Round Hole (SP CH-1 side)
Holes for fixing screw
Rotary erase head's lead wire (Model for flying erase capability)
Round Hole (SP CH-1 side)
Holes for fixing screw

Fig. 5-11-8. Lower Drum

5-12. HOW TO PROCEED WHEN THE CASSETTE CANNOT BE REMOVED


The cassette cannot be removed.
Find the cause of trouble and repair it (Try turning the loading motor by hand, etc.).
NG
Connect the mode selector and keep the left side (⇦) of its mode selector key pressed to unload. Stop when the roller guide gets into the cassette lower part (Stop before front unloading starts. Take care of tape entanglement).
See Fig.5-12-1.
Turn the capstan motor by hand from the bottom side to remove tape slackness.
Keep the left side (⇦) of the mode selector key pressed to perform front unloading.
In the eject-completed mode, remove the cassette.
Confirm the position of each gear, cam, mode detection switch, etc. in the initial condition (unit repairing).
End
NG
Remove the mechanism main unit as explained in 5-1.
Remove the holder bracket and the front helical gear as explained in 5-3-2 (Do this with the COMPL cassette mechanism and the COMPL holder motor still attached to the mechanism main body).
Remove the COMPL holder motor as explained in 5-3-1 (Be sure not to remove the COMPL cassette mechanism. If removed in this condition, the tape would be damaged).
See Fig.5-12-1.
Turn the main cam clockwise by hand from the bottom side to unload. Stop when the roller guide gets into the cassette lower part.
Turn the capstan motor by hand from the bottom side to remove tape slackness.
Push the COMPL cassette mechanism rack in the front unloading direction.


Before unloading

After unloading

Perform unloading using the mode selector.

First rotate the capstan motor by hand from the bottom to take-up the tape slack, and perform front-unloading using the mode selector.

Fig. 5-12-1

6. MECHANISM ADJUSTMENT

6-1. OPERATING THE MECHANISM WITH NO CASSETTE INSERTED (See Fig. 6-1-1.)

1) Attach black vinyl tape to the T. END and T. TOP sensors to prevent light from entering.
2) Push the TRAY LOCK LEVER in the direction of the arrow to maintain the unlocked condition. Release the lever just before the TRAY starts moving down.
3) In this condition, operation is possible in every mode. However, the following procedures are necessary to operate the unit in the REC, REW and R-SEARCH modes.

REC mode :	Push the SAFETY SW LEVER to turn the SAFETY SWITCH (Erasure Prevention Switch) ON, then press the REC button. If the SAFETY SWITCH is not turned ON, the unit will enter the EJECT mode.
REW/R-SEARCH :	After pressing the REW button, turn the TAKE-UP REEL ASS'Y by hand. Otherwise, the reel sensor will operate, setting the INITIAL mode after 2 to 3 seconds.

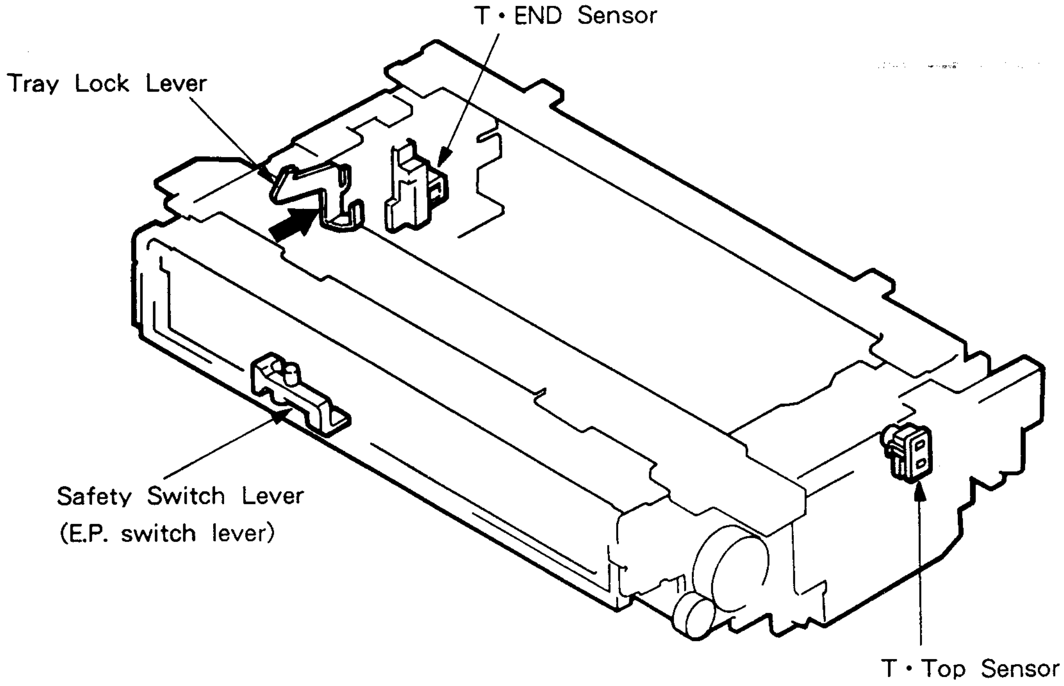


Fig. 6-1-1. Preparations for Adjustment

6-2. REEL TABLE HEIGHT ADJUSTMENT AND TORQUE CHECK

6-2-1. Reel Table Height (See Fig. 6-2-1.)

If the SUPPLY REEL ASS'Y or the TAKE-UP REEL ASS'Y is replaced, it will be necessary to adjust the REEL TABLE height.

(1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.

(2) Attach the cassette stand plate gauge (VHJ-0001) and slide the gauge in the direction of the arrows.

(3) Confirm that, when the gauge stops, the REEL TABLEs are not in contact with surface A of the plate and are in contact with surface B.

(4) If the REEL TABLE is in contact with surface A, remove a spacer and check again.

(5) If the REEL TABLE is not in contact with surface B, add a spacer and check again.

(6) Remove the cassette stand plate gauge.

(7) Set the EJECT mode with the mode selector.

(8) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.

Note :

- Adjust the reel table height by adding or removing spacers (0.13t, 0.25t, 0.3t, 0.4t and 0.5t) as appropriate so that the height meets the specifications. Use the same method for both the TAKE-UP REEL TABLE and the SUPPLY REEL TABLE.
  (The 0.5t washer is included as the standard washer for the SUPPLY REEL ASS'Y. The 0.4t washer is included as the standard washer for the TAKE-UP REEL ASS'Y.)
- If the height of the reel table is not within the specified value, the tape edge might be damaged as a result, or the tape path adjustment might not be possible to make.

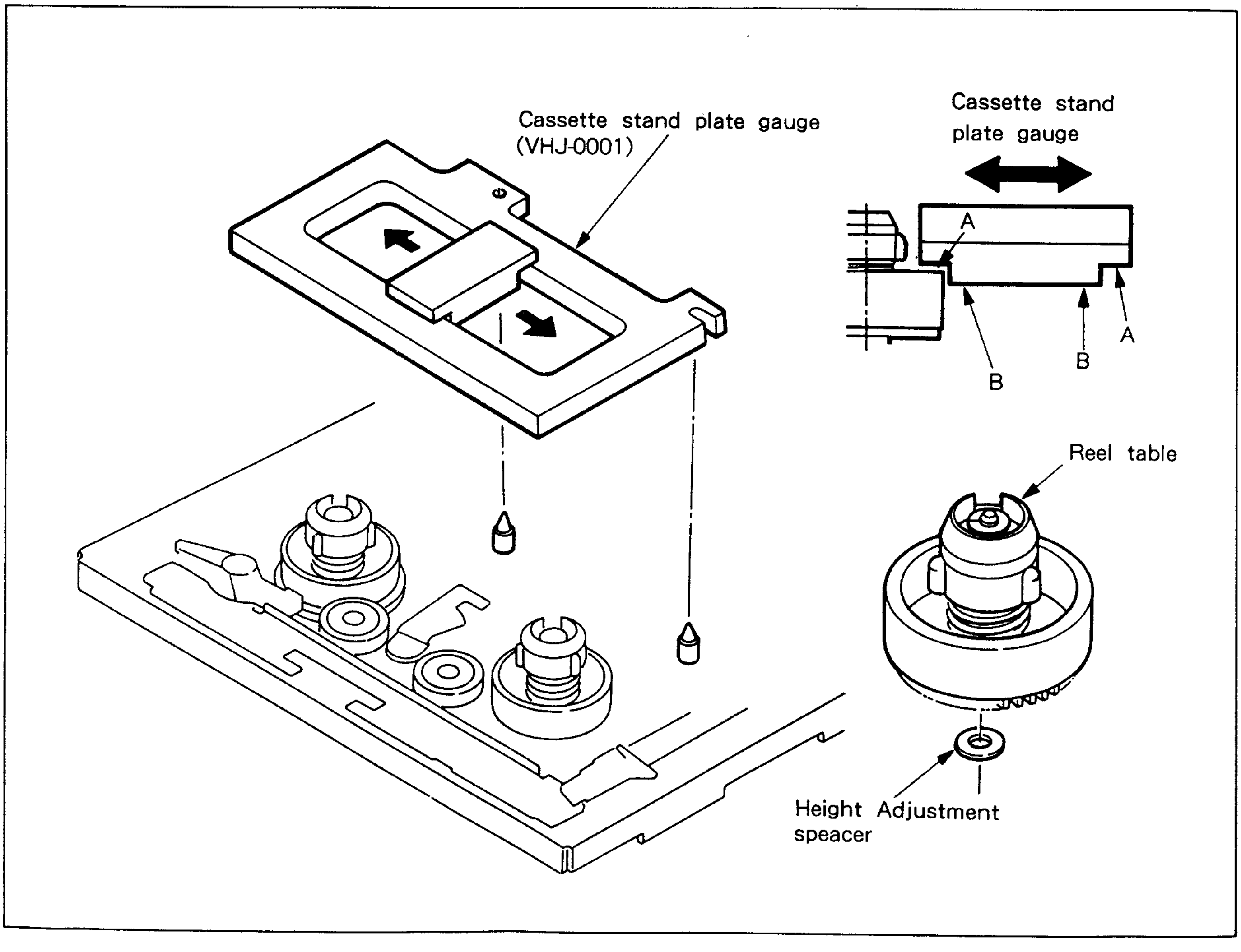


Fig. 6-2-1 . Reel Table Height Adjustment

6-2-2. Torque Check (See Fig. 6-2-2.)

1) Set the unit to operating condition without a cassette inserted as instructed in 6-1.
2) Measure the SUPPLY REEL TABLE torque in the REW mode, and confirm that it is 750gcm or more. Perform this measurement keeping the torque gauge in a fixed position with your hand (locked torque).
3) Measure the TAKE-UP REEL TABLE torque in the F.FWD mode, and confirm that it is 600gcm or more (locked torque).
4) Measure the TAKE-UP REEL TABLE torque in the playback mode (SP tape speed), and confirm that it is within 100 through 160gcm (locked torque).
5) Measure the SUPPLY REEL TABLE torque in the REV (F-SEARCH) mode, and confirm that it is within 150 through 240 gcm (locked torque).
6) After confirming that torque readings are within the specifications for each mode, check the following :
   - ⓐ Dirt on the capstan motor and the REEL PULLEY groove.
   - ⓑ Deterioration of the REEL DRIVE BELT.
   - ⓒ Deterioration of the FRICTION GEAR ASS'Y felt (torque during playback).
   - ⓓ Wear and damage of the COMPL CLUTCH MECHANISM and the reel drive system gears.

Note1 : Items ⓑ, ⓒ and ⓓ require replacement if found defective.

Note2 : The measured value of torque during FF and REW represents the value 2 seconds after starting.

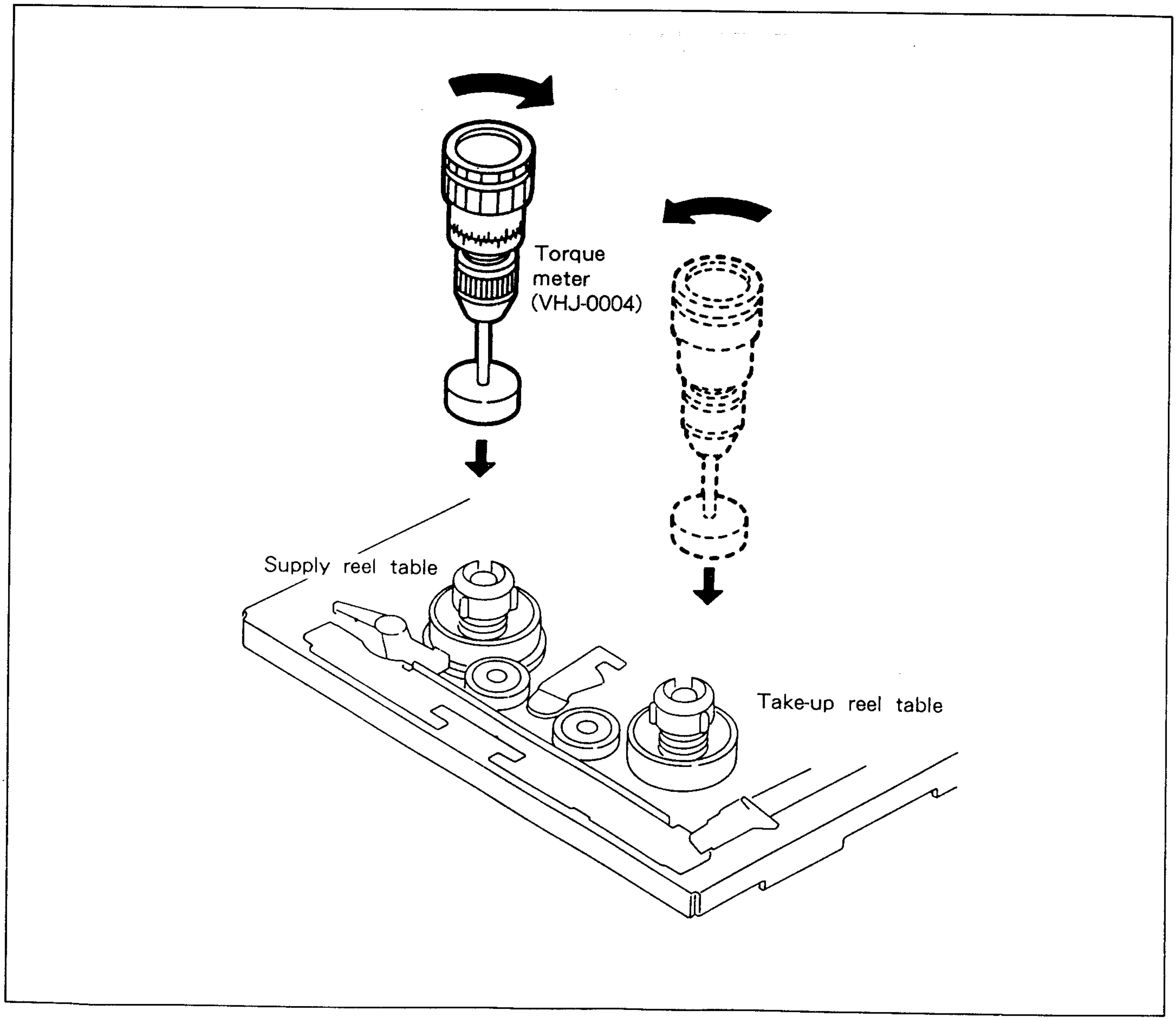


Fig. 6-2-2 Checking REW/FF/PLAY Torque

6-3. TENSION POLE (BACK TENSION GUIDE) POSITION ADJUSTMENT AND BACK TENSION TORQUE CHECK

6-3-1. Tension Pole (Back Tension Guide) Position Adjustment (See Fig. 6-3-1.)

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Set the PLAY mode with the mode selector (VHJ-0050).
3) Attach the position adjustment gauge (VHJ-0049) ①.
4) Confirm that the tension pole ② is within the position adjustment gauge frame.
5) In case the tension pole is not within the above-mentioned frame, adjust it by loosening the screw ④ a little and changing the mounting position of the BAND HOLDER ⑤ in the direction of the arrow Ⓐ.
6) Remove the position adjustment gauge ①.
7) Set the EJECT mode with the mode selector.
8) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
9) Confirm that back tension torque is within 50 ± 10gcm, as instructed in 6-3-2 below.

6-3-2. Back Tension Torque Check (See Fig. 6-3-1.)

1) Attach the cassette torquemeter (VHJ-0016) and set the PLAY mode.
2) Confirm that back tension torque is within 50 ± 10 gcm.
3) In case back tension torque does not meet the above specification, proceed as follows:

ⓐ Clean the portion where the brake band (BAND HOLDER ASS'Y) ⑦ of the SUPPLY REEL ASS'Y ⑥ makes contact.

ⓑ Confirm that the brake band of the BAND HOLDER ASS'Y ⑦ does not make wear and that it is clean. If wear or dirt is found, replace the band holder assembly ⑦ as instructed in 5-7-3.

ⓒ Replace the TENSION LEVER ASS'Y SPRING COIL ⑧.

Note: Always follow procedures in 6-3-1. Tension Pole Position Adjustment after performing ⓐ, ⓑ and ⓒ.

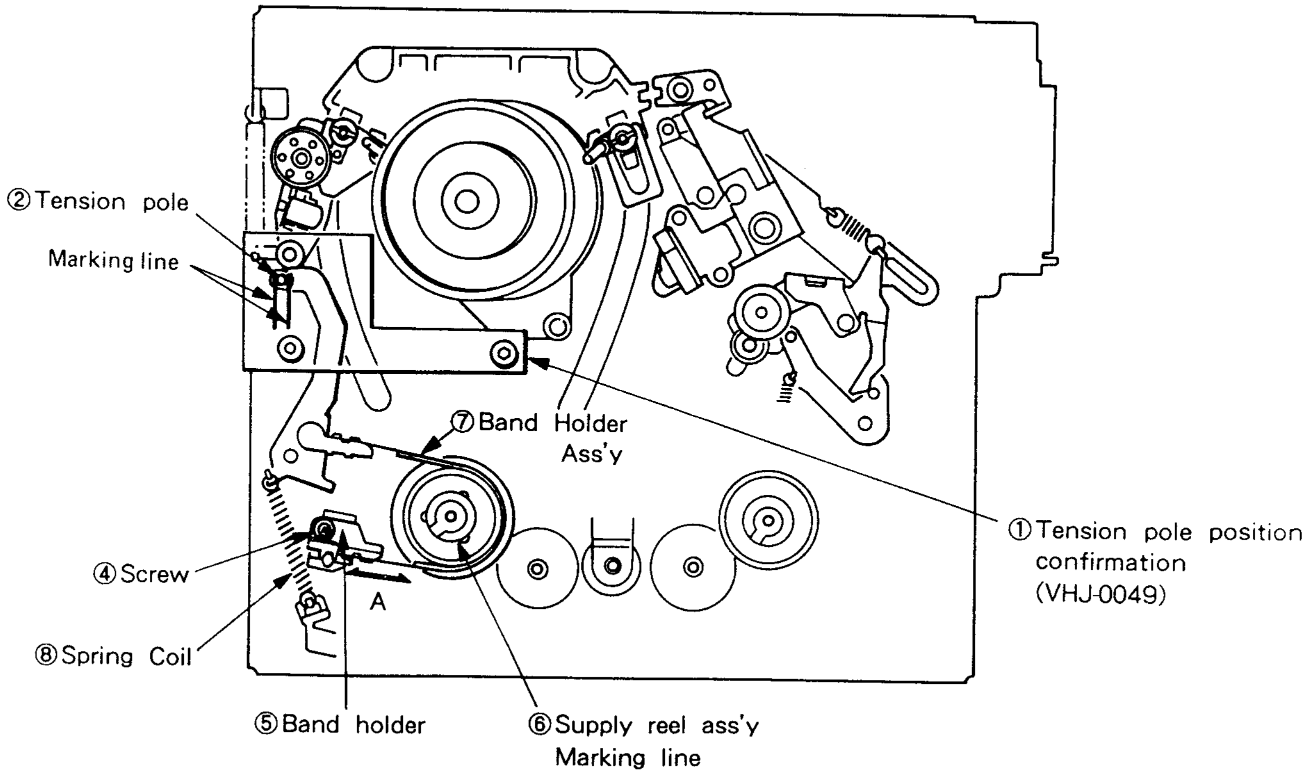

②Tension pole
Marking line
⑦Band Holder Ass'y
①Tension pole position confirmation (VHJ-0049)
④Screw
A
⑧Spring Coil
⑤Band holder
⑥Supply reel ass'y Marking line

Fig. 6-3-1. Tension Pole Positioning Adjustment

6-4. TAPE PATH ADJUSTMENT

The tape path mechanism is precisely adjusted at the factory. Normally no readjustment is required, but checking and/or adjustment is necessary when parts of the tape path mechanism among those shown in the figure below (See Fig. 6-4-1.) have been removed or replaced after a long period of use.

This operation consists of adjusting the various guides so that the tape drawn out from the supply reel runs smoothly along the DRUM (CYLINDER) lead surface. A way of grasping the tape path condition by electronic means is monitoring the video head output envelope waveform with an oscilloscope. However, the fact that visual observation is essential in order to know whether the tape is running through the various guides in a smooth and natural way should be kept in mind when checking and adjusting.

Also remember that the position of tape guides is not greatly affected by the replacement of the UPPER DRUM (UPPER CYLINDER) or the COMPL DRUM (COMPL CYLINDER), provided that it is correctly performed, and that only the replaced parts should be adjusted after replacing a tape guide or COMPL HEAD BRACKET, since the position of the other tape guides shall not change considerably.

6-4-1. Preparations for Adjustment

(1) Clean the tape transport surfaces (See Fig. 6-4-1.).

(2) Connect the oscilloscope. Connect the channel 1 probe to the envelope waveform test point, and the channel 2 probe to the SW30 (RF SW P) test point. During adjustment, apply a trigger to the low side of the SW30 (RF SW P) in order to monitor the waveform output from channel 1 of the video head.

Note : Since oscilloscope connection points differ according to the model, refer to the "Test Point for Tape Path Adjustment" allocation figure in the electric circuit adjustment section of the service manual book.

(3) Use a dentist's mirror for visual observation of tape path condition.

(4) Use a nut box (VHJ-0048) for adjustment of the fixed guides.

(5) Use an eccentric driver (VHJ-0003) for adjustment of the guide rollers.

(6) When adjusting height of the fixed guide, guide rollers or COMPL head bracket, turn the special nut or the upper flange clockwise to push the tape downward, and counterclockwise to make the tape rise up.

(7) Do not use the damaged cassette tapes for tape path adjustment.

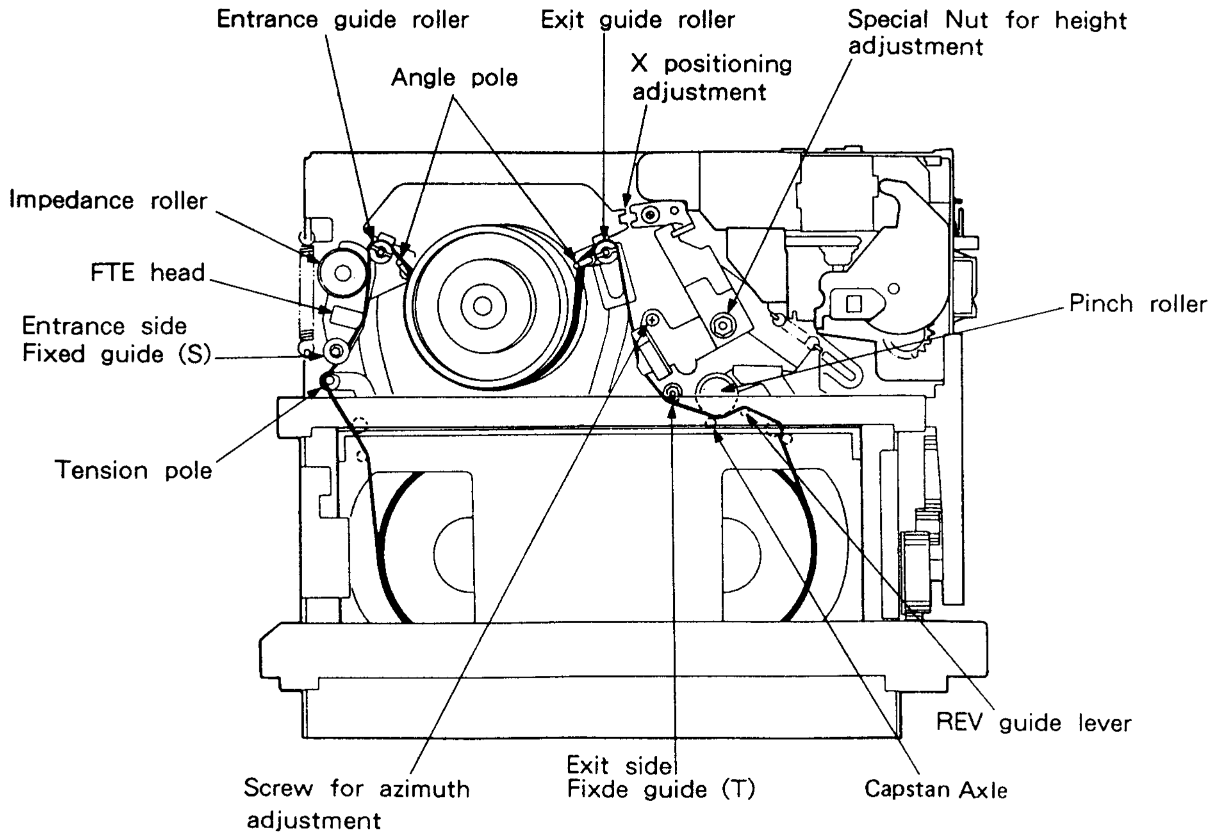

Entrance guide roller
Exit guide roller
Special Nut for height adjustment
Angle pole
X positioning adjustment
Impedance roller
FTE head
Entrance side Fixed guide (S)
Tension pole
Pinch roller
REV guide lever
Screw for azimuth adjustment
Exit side Fixde guide (T)
Capstan Axle

Fig. 6-4-1. **Preparation for Adjustment**

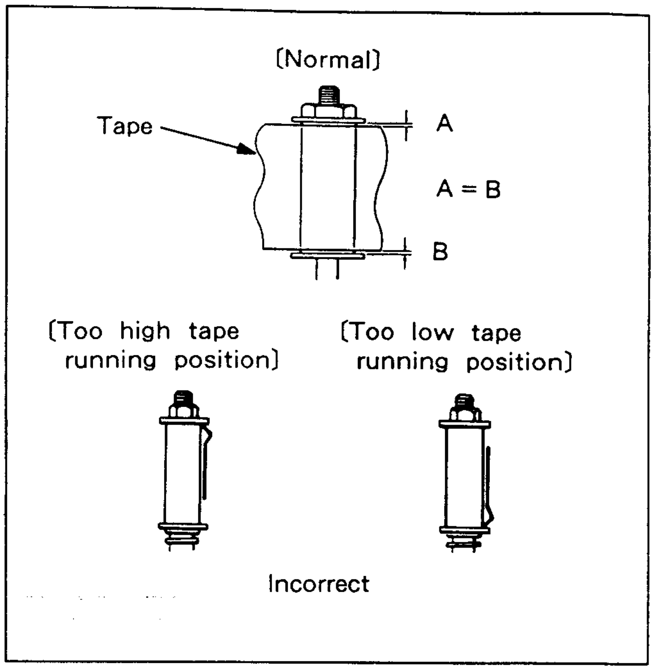
6-4-2. Adjustment by Visual Observation after Guide Roller, Fixed Guide or COMPL Head Bracket Replacement

Perform this adjustment after removing or replacing any of the above parts. Only for the replaced or removed parts, play back an alignment tape (VHJ-0009) beforehand and adjust height by visual observation.

(1) Exit Side Fixed Guide (See Fig. 6-4-2.)
Adjust so that the tape upper edge does not make contact with the fixed guide upper flange, and the tape lower edge does not make contact with the fixed guide lower flange. Gaps A and B should remain equal.

(2) Guide Rollers (See Fig. 6-4-3.)
The tape should not be curled by the guide roller upper and lower flanges. It should also run smoothly, without moving up and down on the DRUM (CYLINDER) lead surface.

Note : An excessive guide roller pressure may cause tape damage.


[Normal]
Tape
A
A = B
B
[Too high tape running position]
[Too low tape running position]
Incorrect

6-4-2. (1) Pre-set For Exit Side Fixed Guide

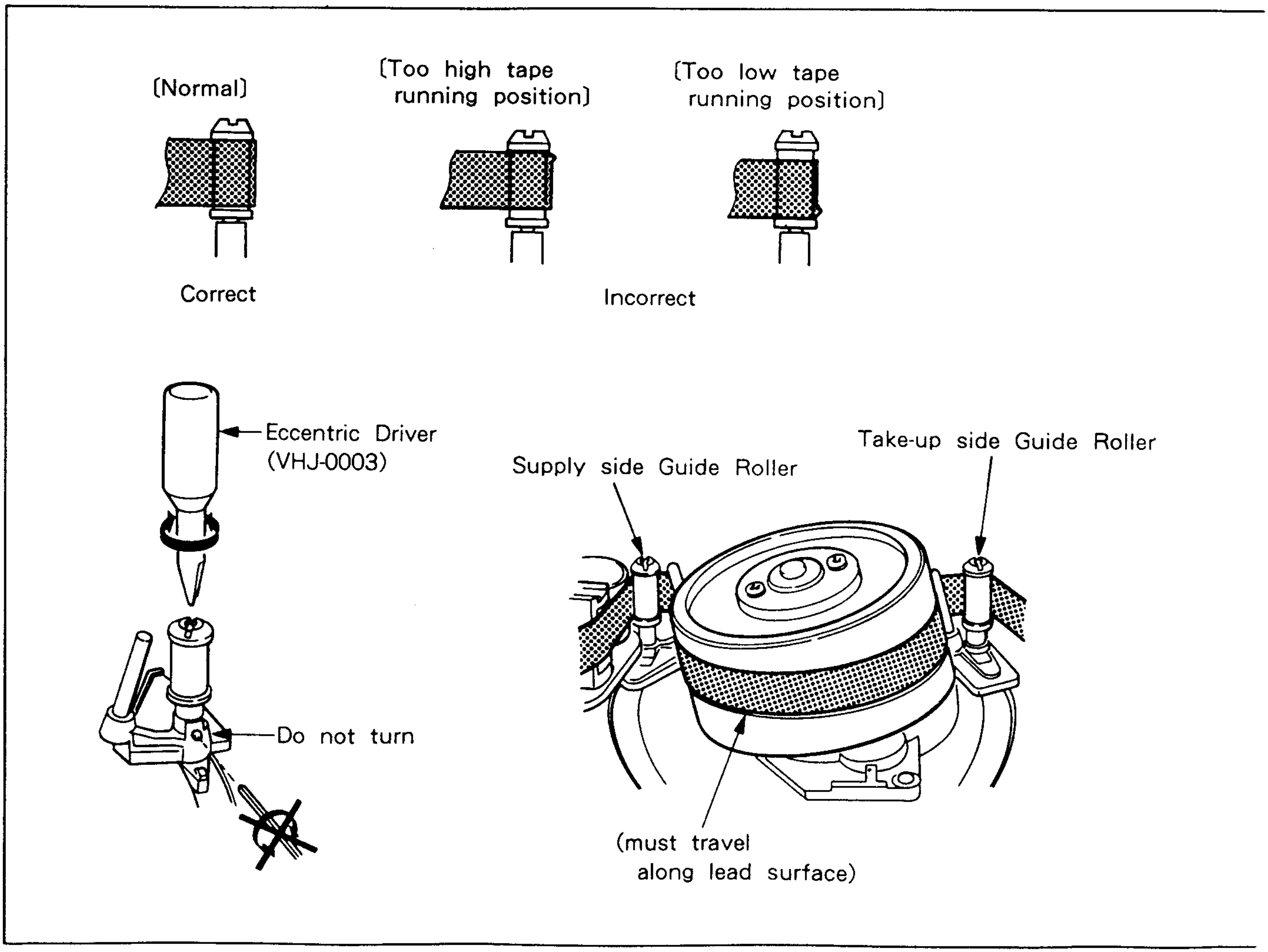

[Normal]
[Too high tape running position]
[Too low tape running position]
Correct
Incorrect
Eccentric Driver (VHJ-0003)
Do not turn
Supply side Guide Roller
Take-up side Guide Roller
(must travel along lead surface)

Fig. 6-4-3. (2) Pre-set for Guide Roller

(3) COMPL Head Bracket (ACE Head) (See Fig. 6-4-4.)
Adjust the special nut so that the tape edge runs between the audio head upper end and the control head lower end. Gaps A and B should be of about the same width. Since at this point it is only required that the control signal is picked up and the servo circuit works normally, no adjusting screws except the COMPL head bracket special nut should be touched.

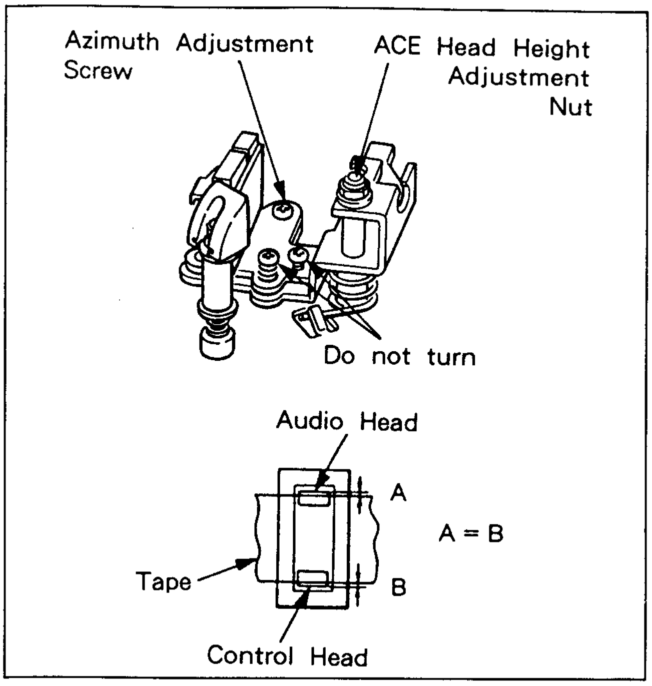

Azimuth Adjustment Screw
ACE Head Height Adjustment Nut
Do not turn
Audio Head
A
A = B
Tape
B
Control Head

Fig. 6-4-4. (3) Pre-set for Compl Head Bracket

6-4-3. Entrance Side Fixed Guide (S) Height Adjustment (See Fig. 6-4-5.)

The P90 mechanism entrance side fixed guide comes in two types ; the one in this unit is equipped with an upper flange and a spring coil, and it requires height adjustment. The other type is not provided with an upper flange and a spring coil. Height is naturally set when the special nut is fastened, so adjustment is not required.
For units with an upper flange, perform height adjustment as explained below. Even for types which do not require height adjustment, check whether the lower tape edge runs along the lower flange. Be careful not to fasten the special nut excessively, causing the axle to run idle.

1) Rotate the fixed guide (S) counterclockwise to lift the tape somewhat, then insert the fixed guide height gage (VHJ-0053) into the lower side of the fixed guide (S) lower flange.
2) Rotate the fixed guide (S) special nut clockwise a little at a time until the lower flange makes contact with the upper surface of the fixed guide height gage, causing a slight drag.
3) After rotating the special nut 90° counterclockwise, remove the Axed guide height gauge.
4) After adjusting the guide rollers in section 5-4-4, play back the alignment tape (VHJ-0009). Confirm that the tape lower edge runs in close contact with the fixed guide (S) lower flange. In case too much pressure has left a gap between the tape and the lower flange, or excessive lifting has caused curling of the tape lower edge, perform fine adjustment. However, do not adjust the special nut beyond 90° clockwise and 45° counterclockwise.

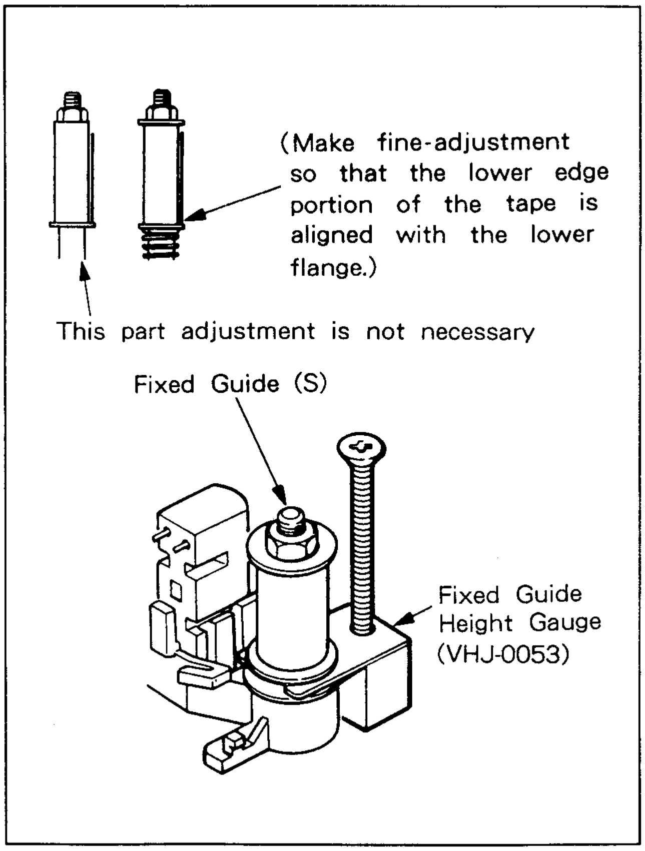

(Make fine-adjustment so that the lower edge portion of the tape is aligned with the lower flange.)
This part adjustment is not necessary
Fixed Guide (S)
Fixed Guide Height Gauge (VHJ-0053)

Fig. 6-4-5. Entrance Side Fixed Guides

6-4-4. Guide Roller Adjustment (See Fig. 6-4-6.)

1) Play back the alignment tape (VHJ-0009), press the tracking control key and adjust the envelope waveform to the maximum level.
2) Loosen the entrance and exit guide rollers by rotating them counterclockwise, then rotate them clockwise alternately until they are fastened and a flat video output waveform is obtained.
3) Confirm that the envelope waveform is not deformed, and check visually that no curling occurs at the guide roller upper and lower flanges.
4) Press the tracking control key and set the envelope waveform level to approx. 50% of the maximum. In this condition, confirm whether the envelope waveform is flat. It will not, showing valleys or peaks at the first half (entrance) or second half (exit), if the guide roller pressure is excessive or insufficient.
   In case there is unevenness in the first half (entrance), adjust the entrance side guide roller. If the second half (exit) shows trouble, adjust finely the exit side guide roller.

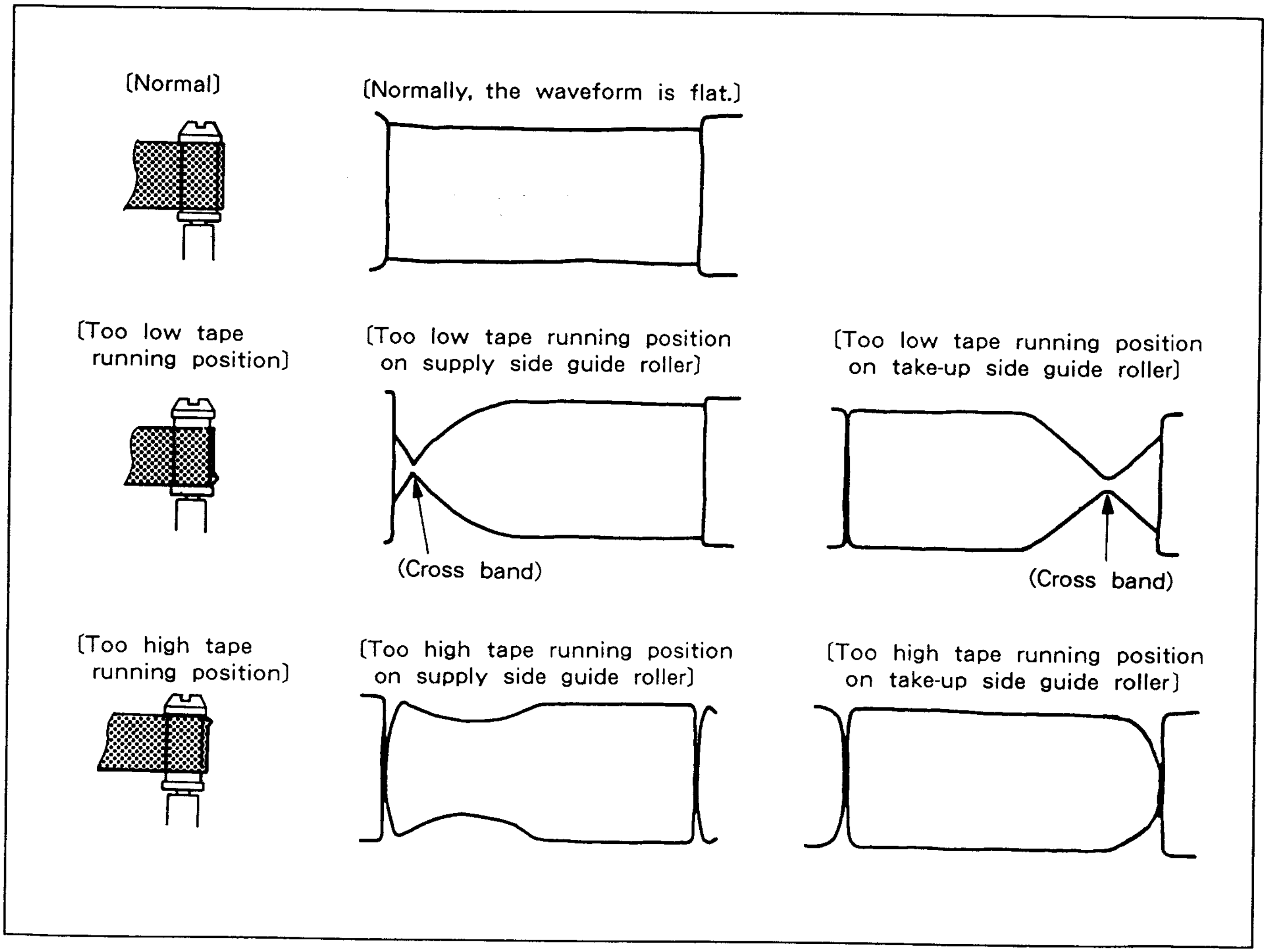

(Normal)
(Normally, the waveform is flat.)
(Too low tape running position)
(Too low tape running position on supply side guide roller)
(Cross band)
(Too low tape running position on take-up side guide roller)
(Cross band)
(Too high tape running position)
(Too high tape running position on supply side guide roller)
(Too high tape running position on take-up side guide roller)

Fig. 6-4-6. Guide Roller Adjustment

6-4-5. Exit Side Fixed Guide (T) Adjustment (See Fig. 6-4-7.)

1) Load the alignment tape (VHJ-0009) and set the PLAY mode.
2) Rotate the special nut counterclockwise so that the lower flange lifts the tape until its lower edge is slightly curled.
3) Rotate the special nut clockwise a little at a time until curling of the tape lower edge is removed.
4) Confirm at each mode (PLAY, F.SEARCH, R. SEARCH, F.F and REW) that the tape runs along the lower flange and that no curling occurs.

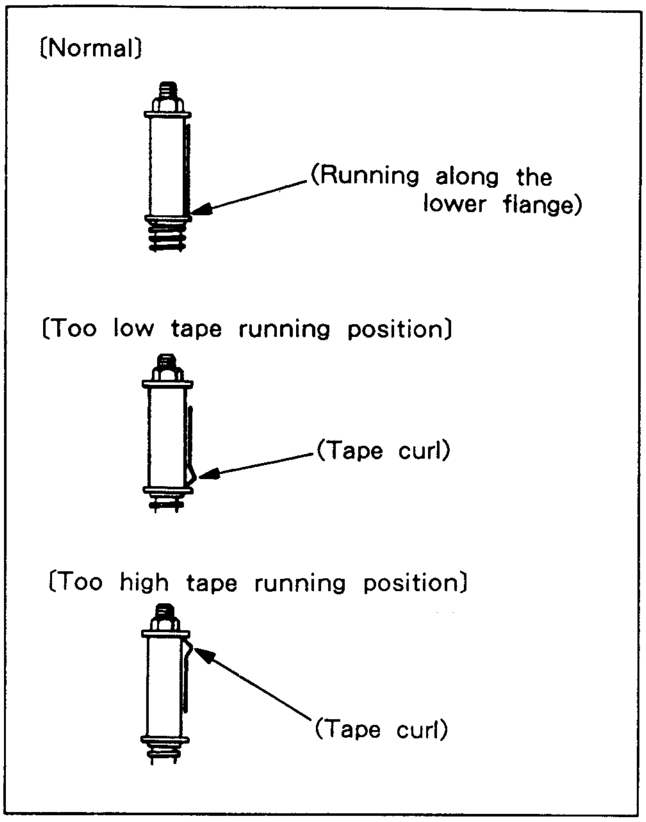

[Normal]
(Running along the lower flange)
[Too low tape running position]
(Tape curl)
[Too high tape running position]
(Tape curl)

Fig. 6-4-7. **Fixed Guide (T)**

6-4-6. COMPL Head Bracket (ACE Head) Adjustment

(1) Height Adjustment and Azimuth Adjustment (See Fig. 6-4-8.)

1) Load the alignment tape (VHJ-0009) and set the PLAY mode.
2) Monitor the audio output waveform with the oscilloscope.
3) Rotate the azimuth adjustment screw until the audio output waveform amplitude is maximum.
4) After loosening the ACE head height adjustment special nut, rotate it slowly clockwise until amplitude of the audio output waveform is maximum, then adjust it finely clockwise to the point just before the said waveform amplitude begins to decrease.
5) Rotate the azimuth adjustment screw until amplitude of the audio output waveform is maximum.
6) Confirm that the audio output waveform amplitude does not fluctuate.

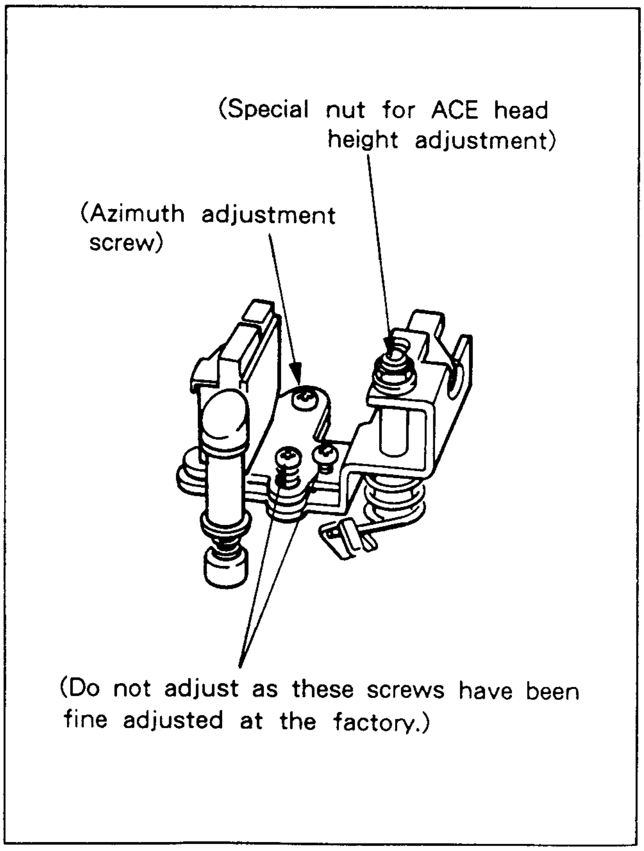

(Special nut for ACE head height adjustment)
(Azimuth adjustment screw)
(Do not adjust as these screws have been fine adjusted at the factory.)

Fig. 6-4-8. **Compl Head Bracket**

(2) Tracking (X Value) Adjustment (See Fig. 6-4-9.)

1) Load the alignment tape (VHJ-0009) and set the PLAY mode.

2) Set tracking to the center position with the tracking control key (See Note below).

3) Rotate the stopper bracket fixing screw 180° counterclockwise.

4) Monitor the video head output envelope waveform with the oscilloscope.

5) Adjust the stopper bracket position so that amplitude of the envelope waveform becomes maximum at the tracking center and the envelope waveform amplitude changes by the same amount when shifting the tracking center by pressing the plus (+) and minus (–) tracking control keys.

6) Tighten the fixing screw.

7) (Model for LP mode tape speed capability)
Playback the alignment tape (VHJ-0052) and set the tracking to the center using a tracking control key.
Then confirm that the playback picture on screen is normal. If not, Make readjustment by referring to items 1) through 7). To readjust, playback VHJ-0009 and finely adjust the position of the stopper bracket within the range in which the amplitude of the envelope waveform can be held to a maximum.

8) Perform servo circuit PB PHASE (Switching position) adjustment.

Note : For models equipped with auto tracking, always set to the manual tracking mode before adjustment. To confirm the tracking center position, press the tracking keys (+, –) and observe the front panel clock display. It will read "T – : –" at the tracking center, "T – : , T – – : " when keeping the minus (–) key pressed, and "T : –, T : – –" when keeping the plus (+) key pressed. The time indication will be restored 2 to 3 seconds after the tracking keys are released.

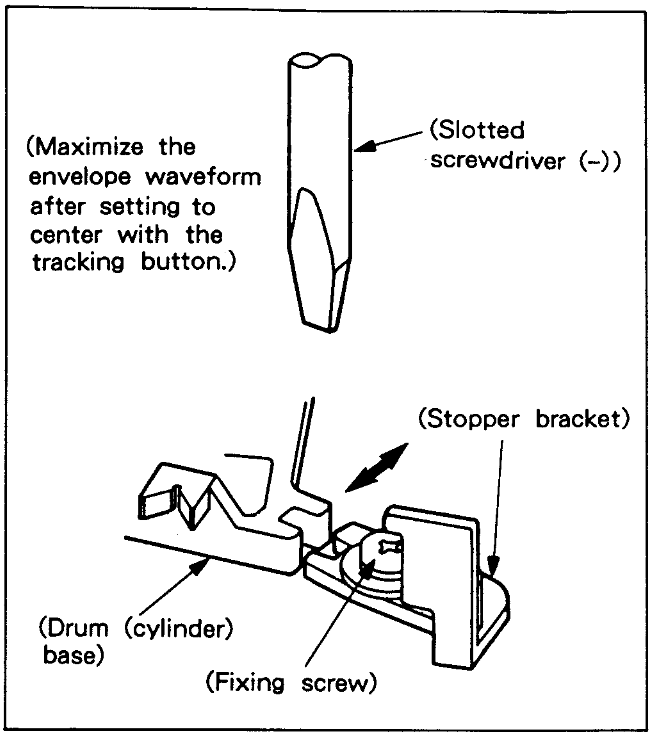

(Maximize the envelope waveform after setting to center with the tracking button.)

Fig. 6-4-9

6-4-7. Checking after Adjustment

Tape running may show a slight change depending upon the type of the cassette tape (thick or thin tape), the start, middle, or end of cassette tape winding, etc. After performing the tape path adjustment with use of an alignment tape, be sure to check the following points. Incidentally, the alignment tape to be used should be E-180 or E-240 cassette should be a good one without any damage to it.

(1) Try to play back the alignment tape (VHJ-0009) and confirm that the envelope waveform rise immediately and that there is no fluctuation in the envelope waveform and the audio output waveform.

(2) Load a cassette tape E-180 and start recording operation in the standard mode. 1 kHz should be fed to the audio input terminal when recording. After recording, the following points should be checked.

1. When the recorded portion is played back, the envelope waveform rise immediately, and no fluctuation in the envelope waveform is observed. Also, no speed drop occurs during the first half period or the last half period. Further, check to be sure that no fluctuation occurs in the audio waveform. Also confirm that neither the tape curling or derailing is caused on the upper or lower flange and the on the read side of the drum.
2. Confirm that no tape curling or derailing occurs in the upper or lower flange of each tape guide and the read side of the drum during each mode of operation, namely, FF, REW, F. SEARCH, and R. SEARCH.
3. Confirm that the envelope waveform rise immediately after changing the mode directly to the PLAY from each mode of FF, REW, F. SEARCH, R. SEARCH, or POWER OFF (INITIAL) and that no tape curling or derailing occurs in the upper or lower flange of the each tape guide and on the read side of the drum.

(3) Load a E-240 cassette tape and perform recording operation in the SP mode. 1 kHz should be fed to the audio input terminal when recording. Now, confirm that the envelope waveform rise immediately upon starting the playback of the recorded portion, and that neither fluctuation in the envelope waveform nor a speed drop occurs during the first half period or the last half period. Also confirm that no tape curling or derailing is caused in the upper or lower flange of each tape guide and on the drum lead surface.

(4) Perform recording for 60 seconds in the SP mode at the start of E-240 cassette winding. Play back the recorded portion and repeat the F.SEARCH ↔ R.SEARCH ten times, following which confirm that no damage is done to the tape edge. If any damage is found on the tape edge, a proper step must be taken as below depending upon the symptom obserbed.

1. When a sawtooth shaped damage is caused on underside of the tape edge by the REV guide
   1) Check to see if damage is done to the tape by the REV guide.
   2) Loosen the tilt adjustment screw of the ACE head bracket by turning it 135° counterclockwise.
   3) Make readjustment of the exit side fixing guide by referring to item 6-4-5.
   4) Make readjustment of the ACE head bracket (azimuth, height and adjustment of X value) by referring to item 6-4-6.
   5) Confirm that no fluctuation in the audio level is caused by loosening the tilt adjustment screw in steps 1) and 2) above. Move the screw a little back if any fluctuation is found (but never move it back to the original position). After adjusting the tilt adjustment screw is readjusted, perform steps 3) and 4) once again.
   6) Confirm again that the E-240 cassette tape does not sustain any damage.
   7) Perform the recording and playback on the E-180 and E-240 cassette tape and confirm that no fluctuation occurs in the envelope waveform and the audio waveform.

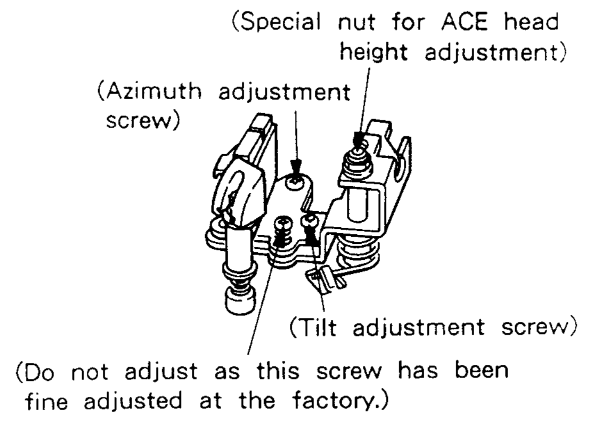

(Special nut for ACE head height adjustment)
(Azimuth adjustment screw)
(Tilt adjustment screw)
(Do not adjust as this screw has been fine adjusted at the factory.)

Fig. 6-4-10 Compl Head Bracket

2. If damage in the form of a sawtooth or a streak is found on the tape edge
   1) Check if a large amount of magnetic particles is adhered to the exit-side guide roller. If magnetic particles cannot be removed in spite of repeated cleaning, the guide roller must be replaced.
   2) Confirm if the tape is held too tightly by the exit-side guide roller, or if the last half of the envelope waveform is flat. If the type is found held too tightly, readjustment should be made by referring to 6-4-4.
   3) Recheck if the damage is still caused on the E-240 tape.
      If similar damage is still found on the tape, the exit-side guide roller should be loosened about 20° counterclockwise.
   4) Check once again that no fluctuation is caused in the envelope waveform or the audio waveform by loosening the exit-side guide roller. To do this, record and play back the E-240 cassette tape.

(5) Perform recording for 60 seconds in the SP mode at the near end of the E-240 cassette tape. Play back the recorded portion and repeat the F. SEARCH ↔ R. SEARCH ten times, following which a check should be made to see if damage is still done to the tape edge. If a damage in the form of a sawtooth or a streak is still occurred on the tape edge by the upper lounge of entrance side guide roller, proceed with the step given below.
   1) Check if a large amount of magnetic particles is adhered to the entrance-side guide roller. If the magnetic particles cannot be removed in spite of repeated cleaning, the guide roller must be replaced with new one.
   2) Confirm if the tape is held too tightly by the entrance-side guide roller, or if the first half of the envelope waveform is flat. If the tape is found held too tightly, readjustment should be made by referring to 6-4-4.
   3) Recheck if the damage is still caused on the E-240 tape.
      If the damage is still found on the tape, the entrance-sideguide roller should be loosened aboud 20° counterclockwise.
   4) Check once again that no fluctuation is caused in the envelop waveform or the audio waveform by looseving the entrance-side guide roller. To do this, record and play back the E-240 cassette tape.

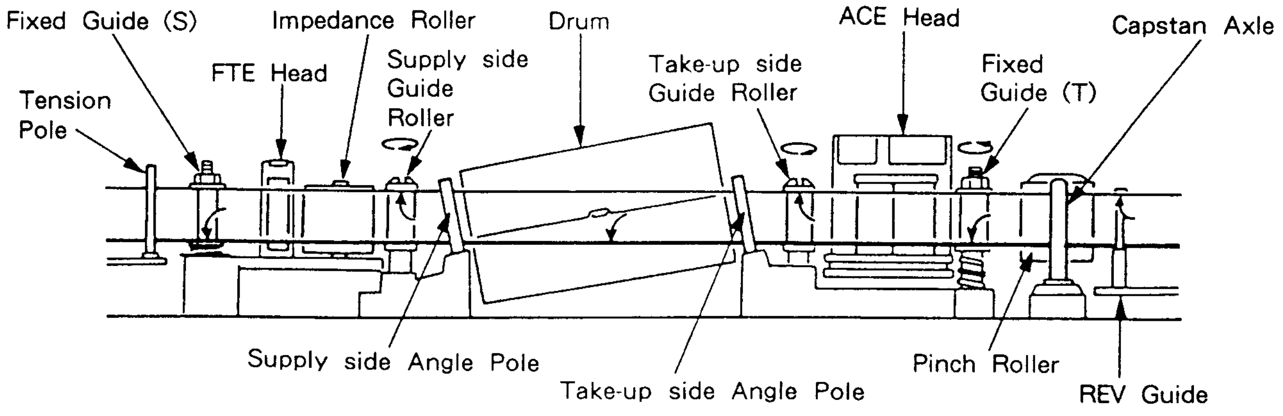


Fig. 6-4-11.